

FEBRUARY 1921 ~ No 181

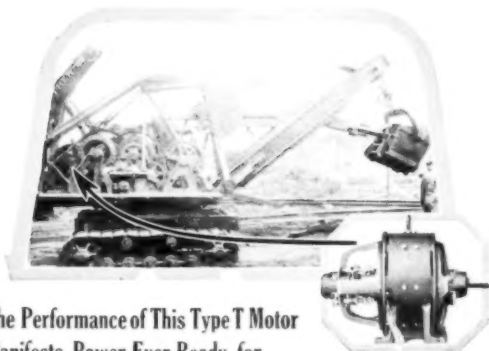
Monthly

A Reference for Buyers

HITCHCOCK'S
**MACHINE
TOOL LIST**

Distributed Free to Machine Tool
Users Everywhere in the United States and to
Dealers in American Machinery Abroad

Published by
A. H. HITCHCOCK
1220-1235 Caxton Building
Chicago



The Performance of This Type T Motor Manifests Power Ever-Ready for Continuous Heavy Duty Work

Dependable power is a prime essential in manufacturing on a small margin of profit.

A motor of unusual strength and endurance is vital. A Type T Motor's ability to operate this Thew Shovel day after day manifests reserve capacity ever-ready for sudden hard pulls. Working under unfavorable conditions and resisting the strain of frequent overloads this Type T Motor demonstrates the value of more and better material in vital parts—heavier shafts, more rugged brackets, field coils insulated for hard service and a commutator eight times improved. These improvements are the result of years of motor experience of 35 Electrical Engineers.

Independence from power trouble far outweighs first cost of a motor. Type T Motors are dependable power units.

Write for facts of Type T Motor performance and Bulletin 2014.

Reliance Electric & Engineering Co.

1050 Ivanhoe Road, Cleveland, Ohio

Branches:

Boston New York Philadelphia Pittsburgh Cincinnati Detroit Chicago

We specialize in motors, sizes 1/2 to 150 h. p., constant and adjustable speed D. C., squirrel cage and slip ring A. C.

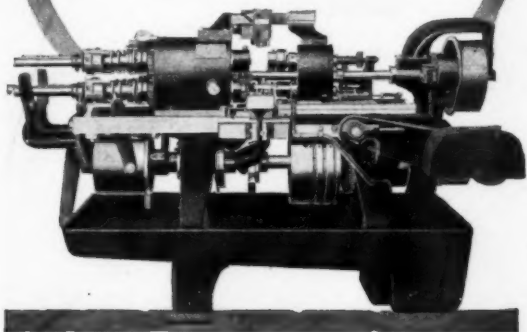
Type T Heavy Duty
RELIANCE MOTORS,
Direct Current



ACME AUTOMATICS

It makes no difference whether your work calls for 2 operations or 10—whether it is rough parts or fine accuracies, Acme Multiple Spindle Automatics will meet the test.

A complete descriptive bulletin showing the application of Acmes to screw machine work is offered. Some of the new features will interest you.



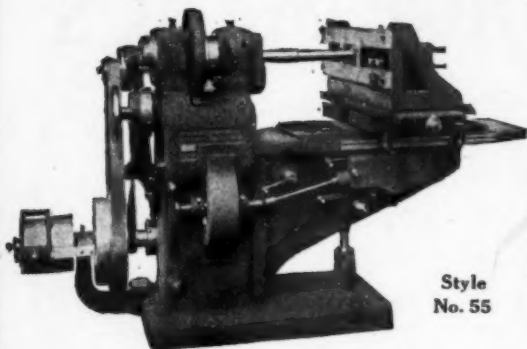
THE NATIONAL ACME COMPANY CLEVELAND, OHIO

New England Plant, Windsor, Vt.

Canadian Screw Plant, Montreal, P. Q.

Branch Offices: NEW YORK BOSTON CHICAGO DETROIT BUFFALO
WAREHOUSES—NEW YORK and CHICAGO
REPRESENTATIVES IN PRINCIPAL FOREIGN COUNTRIES

Moderately Priced



Style
No. 55

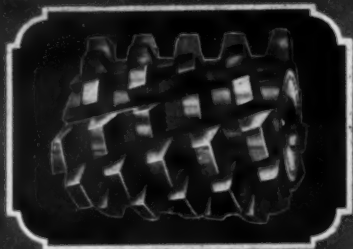
Cylinder Regrinding Machine

Simple
Heald Quality
Large Capacity
Self-Contained
Built Expressly

For the regrinding trade. By eliminating expensive feed units it can be sold at a moderate price. Capable of handling all sizes and shapes of cylinders.

Write for prices and description

The Heald Machine Co.
Worcester, Mass.



BROWN & SHARPE

SPUR GEAR - WORM WHEEL - SPECIAL PURPOSE

HOBBS

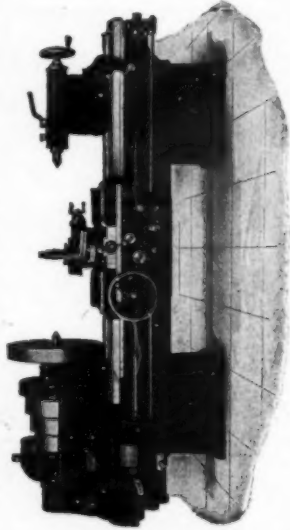
"For Increased Production
and Lowered Operating Costs"

Due to careful selection and heat treatment of the steel used, coupled with the use of special machinery and skilled workmanship, B & S Hobs insure extreme accuracy, durability and consistent uniform production.

Send for Catalog 23 Giving
Hob Data and Listing
at 3000 Cuts

BROWN & SHARPE MFG. CO.
PROVIDENCE, R. I.

SIDNEY LATHES—For All Requirements

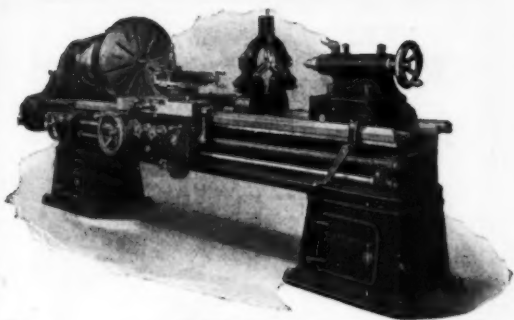


The Sidney Line of medium and heavy duty lathes includes a lathe for every class of work, regardless of the size or type of shop you are running.

Lathes of medium duty in 14, 16, 18 and 20-inch swings, and of heavy duty in 15, 17, 19, 25, 27, 30 and 36-inch swings.

Send for Bulletin No. 45.

THE SIDNEY MACHINE TOOL CO., Sidney, Ohio



Ryerson-Milwaukee 24-in. Heavy Duty Engine Lathe

The Ryerson-Milwaukee 24" Heavy Duty Engine Lathe is furnished with three-step cone drive and double back gearing, providing nine speeds. Four quick-change feeds are furnished in the gear box, these being entirely independent of the screw-cutting mechanism. The usual arrangement of independent change gears is used for screw cutting.

This lathe is of substantial design, the body being a semi-steel casting of deep section, firmly braced every two feet. Bronze bearings are provided in the head stock with adjustment for wear.

In Stock for Immediate Shipment

At prices that will interest you

General Specifications

Swings		Hole Thru Spindle	Taper Hole in Spindle	Cuts Threads per inch	Takes Between Centers—Extreme			Approximate Net Weight, Lbs.		
Over Bed	Over Carriage				10' Bed	12' Bed	14' Bed	10' Bed	12' Bed	14' Bed
24½"	15¾"	21"	No. 5	2 to 32	5' 4"	7' 4"	9' 4"	5,600	6,100	6,700

JOSEPH T. RYERSON & SON

MACHINERY

CHICAGO

ST. LOUIS

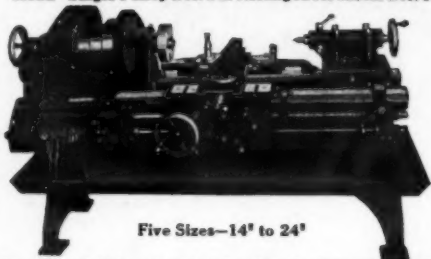
DETROIT

BUFFALO

NEW YORK

"LEHMANN LATHES"

Three Step Cone—Double Back Geared and Geared Head—Single Pulley Drive or Arranged for Motor Drive



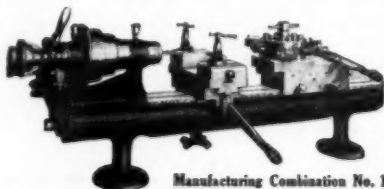
Five Sizes—14' to 24'

These are strictly high-grade engine lathes of superior design and thoroughly good workmanship and material. Built for accuracy and production.

Write for complete specifications and details. Do it today—NOW.

LEHMANN MACHINE CO., 3562 Chouteau Ave., ST. LOUIS, U. S. A.

Potter's Bench Lathe And Valuable Attachments



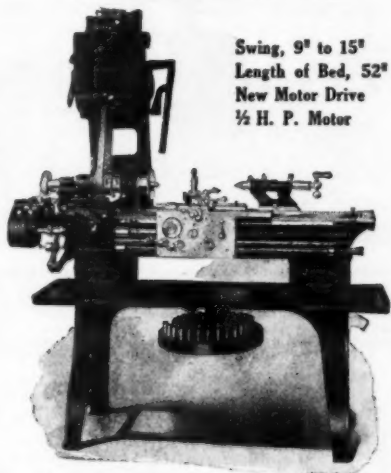
Manufacturing Combination No. 1

Furnished with or without double cross slide and large turret fixture, as shown in illustration, also attachments for milling, internal or traverse grinding, universal grinding and screw cutting, as well as compound slide rest, lever tailstock, tailstock turret, etc. A strong, dependable and versatile precision lathe which quantity production enables us to sell at a close price.

May we send you the fully illustrated Catalog?

S. A. Potter Tool & Machine Works
71 East 130th St., New York City, N. Y., U. S. A.

"There's nothing better than the best"
That Means, "THE HARDINGE"
The Ideal Tool Room Lathe



Swing, 9" to 15"
Length of Bed, 52"
New Motor Drive
½ H. P. Motor

Absolute precision, simplicity of operation and remarkable range of productive capacity are preeminently the vital qualities that make THE HARDINGE a Leader in Tool Room Lathe efficiency.

Swing can be raised 3" or more by raising blocks, greatly extending its range of production. A 60-hole index provides for cutting double, triple or quadruple screw threads.

THE HARDINGE represents the matured mechanical skill and experience of nearly Forty Years of specialized machine tool manufacture.

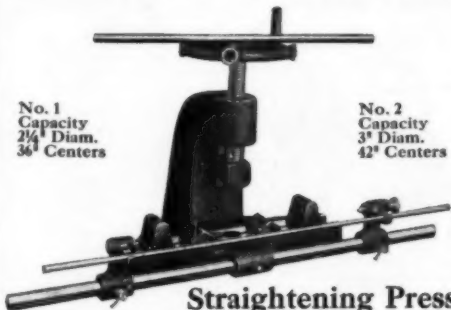
Drop a Postal for Catalog giving full specifications and tables

HARDINGE BROTHERS, Inc., Chicago, Ill.

Two Invaluable Tools

No. 1
Capacity
2 1/4" Diam.
36" Centers

No. 2
Capacity
3" Diam.
42" Centers



Straightening Press

An unusually handy tool in machine shops or garages for straightening shafts, arbors, reamers, boring bars, cam shafts, crankshafts, etc. Centers mounted on front of the press enables work to be tested without taking it to the lathe. Equipped with low blocks for straightening shafts. Gears, collars, etc., can be broached or pressed on or off. High grade steel screw.



Made in
2 sizes,
Nos. 3
and 3 1/2

The "Utility" Screw Press

Straightens shafts, bars, rails, beams, etc. It can also press in or out bushings, and gears or wheels on and off shafts, and forms or bends metal in many shapes.

Massive bed 4' long has hole under screw to allow clearance for solid or hollow pressed pieces. High grade steel accurately chased.

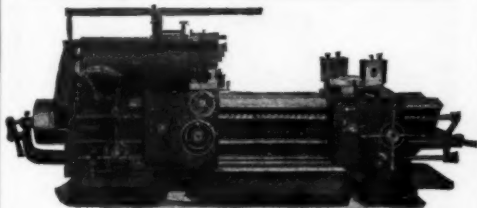
Full data of these superior tools on request

Carl Pletz & Sons, 3116 Spring Grove Ave.,
Cincinnati, Ohio

STEINLE TURRET MACHINE CO.

MADISON, WISCONSIN

Originators of the Heavy Duty Full Swing Side Carriage Turret Lathe



PRE-EMINENTLY— A Manufacturing Machine. WHY?

The first and most important question is one of design, for good design must acknowledge the basic principles underlying the construction of a good machine tool which makes its proper operation entirely satisfactory to those benefiting through its use.

To duplicate a wide range of work rapidly, accurately and economically, the machine must have speeds sufficient to accommodate all diameters and character of work within the range of the machine, power to pull heaviest cuts within the capacity of the best cutting steels, reliability to withstand heavy continuous service day in and day out, facilities for simple or extensive tooling equipment, an ease of operation including power application to feeds and traverses, and convenient location of levers controlling the various functions.

These are a few of the superior features of the Steinle Full Swing Side Carriage Turret Lathe.

May we furnish you with further details covering design or construction of our machine, together with tooling recommendations for the proper production of your work, or ask to have a qualified representative call in order to go personally and thoroughly into the question of what Steinle methods mean as applied to your production questions?



The WICKES BLUE PRINT SYSTEM

—is today being
adopted by the
WORLD'S largest
industries.

WHY?

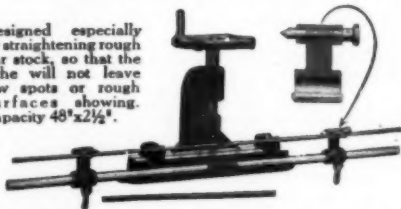
*Send us a re-
quest and we
will tell you*

Wickes Bros.

1802 Water St., Saginaw, Mich.
Builders of Heavy Machinery

"The Towsley" Straightens Bar Stock Easily, Quickly, Accurately

Designed especially
for straightening rough
bar stock, so that the
lathe will not leave
low spots or rough
surfaces showing.
Capacity 48"x2½".



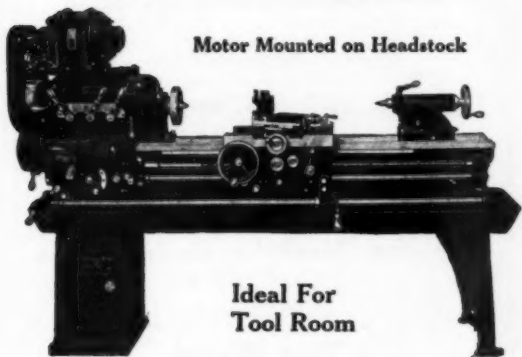
Repair Work also done on bent journals, shafting, axles, etc.
Special Work done, as bending and pressing tubing, axles, etc.

Gives big service at small cost. Write for full details

JOHN T. TOWSLEY MFG. CO., 1037 Woodrow St.,
CINCINNATI, OHIO

New Willard ^{Mattman Bratten} Improved Lathe

D. B. G., Q. C., All-Geared-Head
13" High Power. Also Made 15" Swing



Motor Mounted on Headstock

Ideal For
Tool Room

The NEW WILLARD, fully redesigned, leaves nothing to be desired as to precision and rigidity, enabling your men to do the widest variety of work with maximum speed and economy.

The headstock is a full box section, rugged and self-contained. All speed changes are selective and are made within the headstock. Only one speed can be engaged at one time. All gears are chrome nickel steel and all sliding gears are hardened. Chrome nickel steel spindle is forged and bored from the solid and guaranteed interchangeable.

Six different speeds are available, and six more thru back gears—TWELVE IN ALL. Rigidly accurate bed, with chilled V's and flats, throws practically all wear on the carriage. Top slide of compound rest is a steel casting, and is taper gibbed. Motor drive—D. C. or A. C. SKF bearings thruout headstock and pulley.

*We build WILLARD LATHES in ALL STYLES,
and shall be glad to mail you full description*

The Willard Machine Tool Co., Inc.
F Street, Box 784 - CINCINNATI, O., U. S. A.



COLLETS

for

Lathes and Screw Machines

Any Size

Any Type

Any Quantity

Morrison Machine Products, Inc.
"Collet Specialists"
Rochester, New York

The Word

"HARDINGE"

Stamped on Screw Machine collets or
draw-in chucks for tool room lathes

Guarantees Accuracy

Look for the marking

**We can fill your single or quantity orders
in Round, Square or Hexagon.**

When making inquiries refer to "Chuck Department"

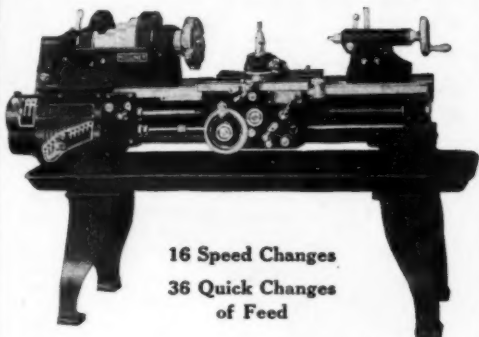
Hardinge Brothers, Inc.

1770 Berteau Ave.

Ravenswood

Chicago, Ill.

Porter - Cable Tool Room Lathe



16 Speed Changes

**36 Quick Changes
of Feed**

Its many special features, taken as a whole, fully establish the superiority of design of the Porter-Cable Tool Room Lathe for practical results.

As an example of its peculiar merit, get the folder and study the Lead Screw, its bearings, control and operation. We shall not attempt to fully describe it here; but suffice it to say that no gears are mounted on the Lead Screw itself, which is suspended on its own independent bearings. It is not splined nor used as a feed shaft. It is so arranged that it always rotates freely with a perfectly balanced motion, without end play, side strain, cramp or distortion. A convenient lever controls its operations.

*Let us send the folder—look it over at your leisure—
You will find it interesting, instructive and profitable.*

The Porter-Cable Machine Co.
Syracuse, N. Y.

Monarch Lathes

give universal satisfaction to the user. They have been doing this for years, and this accounts for the ever increasing demand for **Monarch Lathes.** Built in all styles and with any attachments desired.

Sizes 10 to 30-inch Swing

*Sold by a leading Machinery Dealer
in every machinery center.*



THE MONARCH MACHINE TOOL CO., 106 Oak St., SIDNEY, OHIO



Bunting's "In Stock" Bushings afford a quick cut to economy and speed in machine production.

Write for Stock List "W"

The Bunting Brass & Bronze Co.
Factory at
Toledo, Ohio



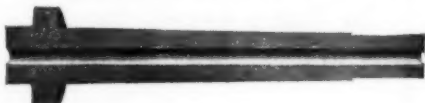
**Dies, Tools, Jigs, Gauges.
Special Machinery, Ex-
perimental Work and
Manufacturing**

Send us your Specifications

Screw Machine Products

**GEO. H. AINGE TOOL, DIE
AND MACHINE WORKS
SPRINGFIELD, OHIO**

**Do the Machines You Build Require
Hollow Bored Forgings
and Steel Shafts?**



If so, it may pay you to submit your blue prints
and let us quote you on such items as Lathe
Spindles, Piston Rods, Rams, Clutch Shafts, etc.

Service You Can Depend On

**American Hollow Boring Co.
Erie, Penna.**



Rhodes 7" Horizontal 3½" Vertical Shaper

The RHODES is applicable to a wide range of accurate machining. For light shaping and slotting where accuracy counts, the RHODES is the thing. Small in size, low in upkeep, big in economy.



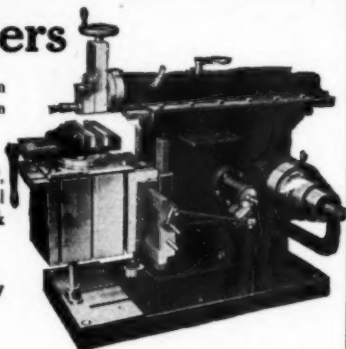
The Rhodes Mfg. Company
Hartford, Conn.

Shapers

The best medium priced Shaper on the market.

Built in 16", 20", and 24" sizes, all back geared crank machines.

A few for early delivery.



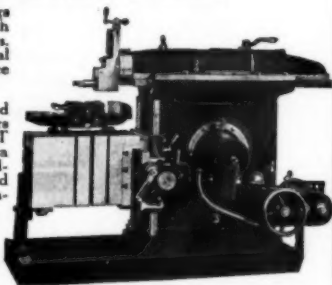
The Osborne & Sexton Mchy. Co.
Columbus, Ohio

Columbia ^{High Grade} Shapers Extra Heavy Duty

Main shaft bearings are ring oiling, with renewable bushings. Other cylindrical bearings bronze bushed.

Selective gear speed box and back gears provide **EIGHT SPEEDS**. Extra large table, centralized control and many other advantages.

Styles 16", 20",
24", 28" and 32".
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No. 7.



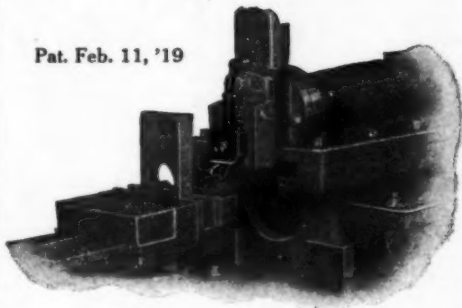
The Columbia Machine Tool Company
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BRUNO

Slotting Attachment

for Shaper and Planer

Pat. Feb. 11, '19



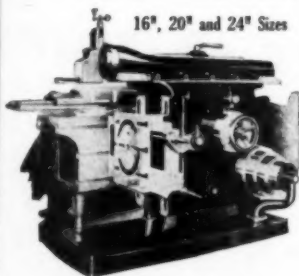
A cutting tool holder which converts your shaper into a Horizontal Slotter and makes possible the most intricate shaping such as is required for dies, jigs, gauges, keyways, slotting, etc.

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ROCHESTER, N. Y., U. S. A.

The Milwaukee

A Powerful and Productive Shaper



16", 20" and 24" Sizes

The stroke of this modern back geared crank shaper is simple, positive and instantly adjustable. Friction locking device is positive and thoroughly effective. Ram is rugged with wide bearing, V-shaped ribs and acts smoothly without chatter. Graduated tool head swivels at any angle and the down feed has micrometer adjustment.

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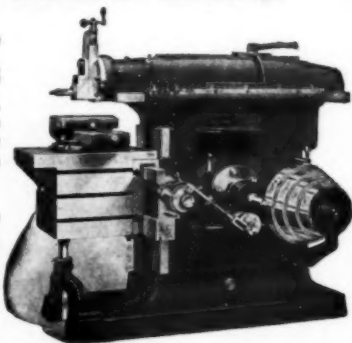
MILWAUKEE SHAPER CO.,

Milwaukee, Wis.

SHAPERS

12", 14", 16"
Plain Crank,
16", 20", 25"
B. G. Crank,
either Cone
Driven or
through
Speed Box.

28" and 32"
Back Geared
Crank,
Single Pulley
Drive.



The Smith & Mills Co. Station B,
Cincinnati, O., U.S.A.

WEAVER

Forcing Presses



are saving time
and money and
improving the
quality of work
in thousands of

**Garages
Electric
Shops
Machine
Shops
and
Factories**

because of their wide range of application to both
bulky and small work, due to their

**Great Depth Adjustment
Quick Release Feature
and Enormous Leverage**

enabling the operator to exert a pressure of 28 tons
without assistance. For complete description and
prices, write for catalogue.

WEAVER MFG. CO.

HARVARD PARK,

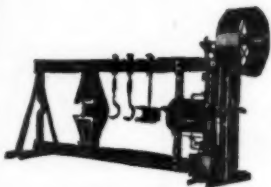
SPRINGFIELD, ILLINOIS



Lourie Hydraulic Presses

Are Known the World Over

We manufacture a complete line of standard hydraulic presses.



We also make special presses.

Write for catalog

Lourie Mfg. Co.
Springfield, Ill.

Atlas Presses

pay for themselves quicker today than ever before.

Built in all sizes for all work which can be practically accomplished by hand.

Atlas Press Co.

Kalamazoo, Mich., U. S. A.



!!! Don't Knock! !!!

Do Your Pressing In An Easy,
Civilized, "Greenerd Arbor" Way



Your Choice
from
15 Pounds
to
40 Tons
Pressure

THE POWER, handiness and dependability of Greenerd Arbor Presses enables users to save time, material and labor. They are used universally with great satisfaction in plants of every size, and in repair shops and garages. They are good for very small work, and in heavy service have taken the place of hydraulic presses. The economy is obvious.

Complete, illustrated information on request



EDWIN E. BARTLETT
NASHUA, NEW HAMPSHIRE





**Knickerbocker asks you
to note the reasons why
engineers order "Rarefied"
Dust Collectors installed:—**

- ☐ Because they are more efficient.
- ☐ Because they are longer lived.
- ☐ Because their cost is moderate.
- ☐ Because they cost less for upkeep and repairs.

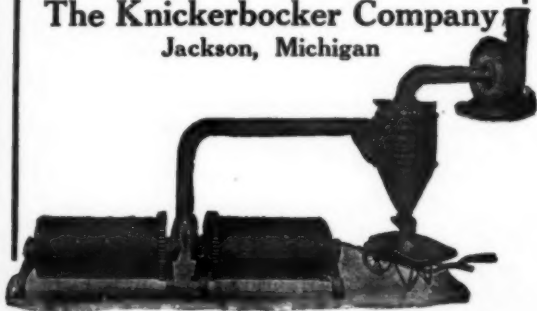
Solvay Process Co. now uses.....	26
Western Electric Co. now uses.....	12
Westinghouse Elec. & Mfg. Co. now uses.....	21
Weston-Mott Co. now uses.....	12
Willis-Overland Co. now uses.....	10

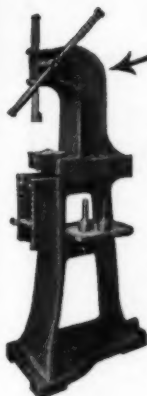
And there are many other users.

The "Rarefied" Dust Collector operates on the "rarefied" or partial vacuum principle. Expert engineers have ordered their installation after exhaustive tests. They are successful with the most difficult dust.

To help you understand the merits of this modern dust collector we would like to send you a copy of our explanatory Booklet. Send us your address today.

The Knickerbocker Company
Jackson, Michigan





**See that
strengthening
rib!**

Nicholson Arbor Presses are built to endure the hardest sort of machine shop service. Frames of best semi-steel, racks, pinions and levers of heat-treated chrome-nickel steel—sturdy and compact—they last for years. Made in five sizes, and of course they're useful for many other sorts of work besides pressing out arbors.

Nicholson Expanding Mandrels

Just nine of them to a set—and they instantly fit *any* hole, round or square, from $\frac{1}{2}$ " to 7". If you're using solid mandrels now, you can figure for yourself the saving in time, labor, and storage space a set of these would effect in your shop.

*Details and prices of these and other
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117 Oregon St.,

Wilkes-Barre, Pa.

Agencies:

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Tokyo, Japan

Our Pipe Benders Meet The Demand



Ever since their invention our hand Pipe Benders have had a steady sale and have given universal satisfaction.

Recently, we have made some improved attachments that permit of a wider range of work and open up a new field in the kind of bending the machine will accomplish.

If you do pipe bending you will find our machine an economical, simple and very efficient appliance in reducing costs and doing better work. For 2" and under.

We have a Bulletin waiting for you. Send for it now.

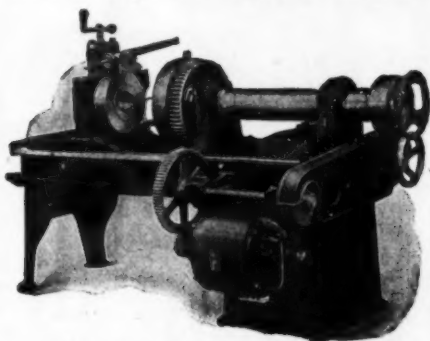
Pedrick Tool & Machine Co.

3644 N. Lawrence St., Philadelphia, Pa.

Manufacturers of Cylinder Boring Bars, Portable Millers, Crank Pin Turning Machines, etc.

Pipe Threading Costs

Are Kept at the Very Lowest Point
With the Top-Notch "B. & K" Machines



(No. 3 Peerless. All Gears are Covered)

Our pipe threading and cutting machines have been standard for more than a third of a century. They are improved up to the minute—practical features that augment the quantity and quality of output.

There are 17 styles and sizes from which to make a selection—you are sure of getting the machine best suited to your work.

Let us tell you about their speed and accuracy, their many conveniences, and their ability to stand up to the most strenuous demands of modern manufacturing.

Bignall & Keeler Machine Works

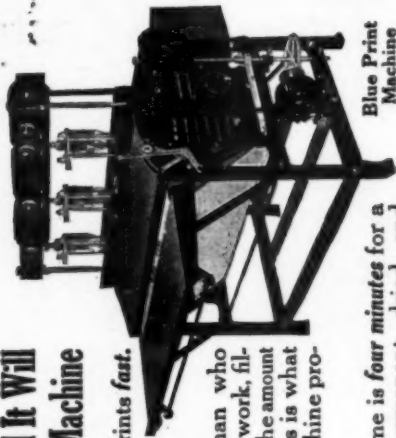
Edwardsville, Illinois

Figure the Labor Cost and You'll Find It Will Pay to Install a Paragon Blue Printing Machine

Paragon Machines make excellent blue prints *fast*. That's why they are profitable. Even though you have only a limited quantity of blue prints to make, this machine pays; it quickly releases the man who runs it for other work, filing, etc.—and the amount of labor it saves is what makes any machine profitable.



**Print Drying
Machine**



**Blue Print
Machine**

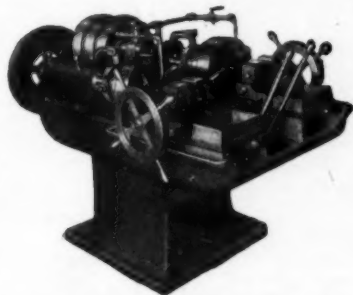
Paragon time is *four minutes* for a good, clear, permanent, dried and ironed blue print—ready for use.

Ask for catalog Y and more details

PARAGON MACHINE COMPANY, ROCHESTER, N. Y.

The Murchey Pipe Threader

Multiplies Threading Production



One man on the Murchey Semi-Automatic Double Head Nipple and Pipe Threading Machine cuts 3,000 to 3,500 standard 1-inch threads or 1,800 nipples in 10 hours.

Reams and threads in one operation. Dies open automatically. Belt or motor drive.

Once cut is started, the machine needs no attention. This permits operator to run a number of Murchey Pipe Threaders at full capacity, multiplying the output of one man several times over.

Catalog and Price on request

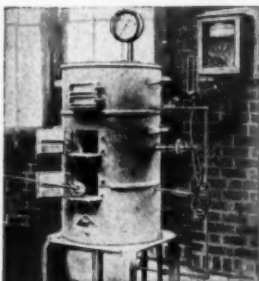
Murchey Machine & Tool Co.

850 Porter Street, Detroit, Mich.

NEW YORK OFFICE	-	-	-	-	99 Warren Street
CLEVELAND OFFICE	-	-	-	-	1625 Williamson Bldg.
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The Triad 3-in-1 Furnace

Cuts Fuel Costs 65%



Combines **THREE** different heat-treating operations in one furnace: (1) pre-heating, (2) high heating, and (3) drawing the temper. This saves floor space, labor and fuel costs—the latter 65%.

Burns oil or gas—position of burner avoids "back-firing." You can get maximum heat in *twenty* minutes. There are no cold corners.

The TRIAD gives you 100% heat-treating efficiency and a mighty big slash in output costs.

Catalog 5 on request

The W. R. Bennett Co., P. O. Drawer X
Elmwood, Conn.



Style "C"



The Hinge



Style "Y"



Style "B"



Style "G"



Style "O"



Style "L"



Style "T"

GITS OIL CUPS

Give perfect satisfaction where others fail. State style and size in which you are interested, and we will send free samples and catalog.

GITS BROS. MFG. CO.
1940 SO. KILBOURN AVE., CHICAGO



Style "H"

Write for your copy of these
interesting pamphlets—
use the coupon.



Check circles you are interested in:

☐ Floor Drills ☐ Forges ☐ Wall or Post Drills
☐ Automatic Stoppage ☐ Grinders and Grinders
☐ Blows ☐ Blows ☐ Blows ☐ Blows

Name _____
Address _____

Canedy-Otto Forges

have a world-wide reputation for strength, simplicity, economy and long service. They are forges designed by men who know your needs and built by men who have acquired unusual skill in a plant that has dominated the industry for 30 years.

CANEDY-OTTO EQUIPMENT

—famous for this quality of in-built service and a certain "handiness" that is appreciated by the man at the bench, whose efficiency and productiveness are increased by the use of these fine tools.

Canedy-Otto Mfg. Company

Chicago Heights, Ill.

Dept. HMT



No. 36 Power Drill

20 inch with back gear; power feed automatic stop. Morse taper spindle socket No. 3 or No. 4.



No. 16 Post Drill

Hand lever feed; positive self feed; adjustable table. Bore 6 to 1 1/4 in. to center of 24-in. circle



No. 5 Blower

Electric driven; dust-proof automatic lubrication; seven speed switch.



No. 4 Grinder

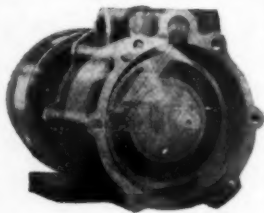
Wheel guards; tight-and-loose pulleys; with or without rests as specified.



**Tiger Forge
No. 253**

Large firepot; convenient hearth; splendid blast; strong construction; for severe service

100% Perfect Tool Lubrication Insured By ROLLWAY Pumps



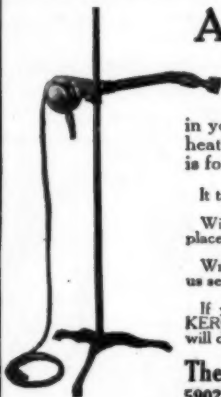
Made in Semi-Positive and Positive Types. They deliver 30% greater volume than other types for size of intake and outlet.

They are valveless, self-priming, have no loss of prime, and do not clog. They require no relief or check valves and no overflow piping. Pump oil or water equally well. Operate at low speeds.

Why not let it save your costly cutting tools?

Michigan Machine Co., Detroit, Michigan

A Gas-Electric Blow Torch



in your shop is just as useful for heating applications, as a lathe is for general machine work.

It takes only a few minutes to install.

Will replace your forge, and take the place of high priced furnace equipment.

Write for a descriptive folder or have us send a torch for trial in your shop.

If you have no gas, ask about our KEROSENE FLAMEBLAST torch; it will do the same work.

The North American Mfg. Co.
5902 Carnegie Av., Cleveland, Ohio



S-C-H Furnace No. 200

For production
work in hardening
steel in lead.

THIS furnace contains two elliptical pots, each 6"x 12"x13" deep. Each pot has separate, independent burners which may be adjusted to hold the pots at the proper temperatures. The port venting the surplus heat may be fitted with a rack for preheating. By gradually heating the work in this manner it is treated without shock or strain.

For successfully heat-treating reamers, taps, thread-cutting dies and tools with sharp edges, or other work which might be harmed by oxidation, this furnace is unexcelled.

Catalog 12-H gives a complete description of the S-C-H line of 75 heat-treating furnaces. Copy sent on request.

THE STRONG, CARLISLE & HAMMOND COMPANY

CLEVELAND, OHIO

Branches:

Boston

New York

Chicago

Philadelphia

Detroit

SCH INDUSTRIAL FURNACES

Tucker Oil Hole Covers

Pat. Mar. 30-1915

For all purposes, where oil is used as a lubricant. Every cup a practical device.

Send for Catalogue
Oil Hole Covers No. 6



Style G, Closed



Style G, Open

Style E



Style C



Style F, Drive



Style D, Open



Style D, Closed



Rotary Head

W.C. & F.C. TUCKER, Hartford, Conn.

Make *this* case your own!



Carbonizes all kinds of steel

After you have given Ferro Case a fair trial in your shop, you will turn your back on cyanide forever. Ferro Case carbonizes at a lower temperature, thereby avoiding coarse crystallization, warping and wear of furnace linings and crucibles. With greater economy you obtain a better, cleaner, glass-hard case. Moreover

It's a Non-Poisonous Compound

scientifically prepared, which does not lose its effectiveness with age or chemical action, and can therefore be stocked freely without any danger of deterioration.

Ferro Case M is for use in the cyanide melting furnace, and is handled the same way.

Ferro Case S is for sprinkling on hot steel. In either case you get better results in absolute safety.

You will profit by making it your own case. Mail us that trial order today.

C. G. Buchanan Chemical Co.

Sta. H.,

Cincinnati, Ohio

New Silver 20" Drill

Stronger—Larger—Heavier

An ALL-PURPOSE Drill Made in Four Styles

- (1) Plain Lever Feed.
- (2) Combined Lever and Wheel Feed.
- (3) Power Feed and Automatic Stop.
- (4) Power Feed with Back Gearing and Automatic Stop.



	New Style	Old Style
Height.....	75"	68 1/4"
Vertical Travel of Spindle.....	12"	10"
Vertical Travel of Table.....	17 1/2"	16"
Distance from Spindle to Base.....	42 1/4"	41 1/4"
Distance from Spindle to Table.....	28 1/4"	26 3/4"
Shipping Weight.....	860 lbs.	780 lbs.

Our old-style 20" has been a standard drill for many years. The new one creates a NEW standard for all-around efficiency in both tool room and shop. The 12" spindle traverse and the fact that both base and table are planed absolutely square with spindle, adapt it to accurate repair work, such as re-boring cylinders. Spindle thrust has SKF ball bearings.

Write for complete description of this NEW standard drill

The Silver Manufacturing Co.

Box 295, Salem, Ohio, U. S. A. Founded 1854
LONDON PARIS BRUSSELS NEW YORK GENOA SYDNEY CAPE TOWN

Model "E-50"

Sensitive Bench Drill Press

This 2-speed, direct motor drive, high-speed ball bearing drill is especially designed to care for all work, ranging from the smallest to a $\frac{1}{4}$ " hole.

Standard speeds 2,100 and 6,000 R. P. M.

Main spindle is heat treated and ground to size; it is guided through a quill with support at each end in an annular ball bearing.

End thrust is taken up by an end thrust ball bearing under feed arm.

A quick adjustable table has a working surface $5\frac{1}{2}$ " x 5", and will take work up to $4\frac{7}{8}$ " in height.

Surface of table is ground to insure accuracy.

Table has a self-cleaning taper, which keeps the precisely ground main column free from chips, and serves also as a guard to prevent injury to column.

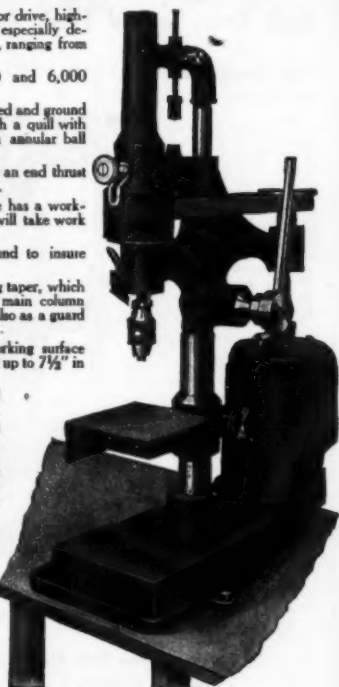
Base has a ground working surface 4 " x 6 ", and will take work up to $7\frac{1}{2}$ " in height.

Base has oil groove and self-cleaning column support.

Your attention is called to another special feature, which is a spindle lock enabling quick changes of drills without the operator's hands coming in contact with belt or pulleys.

An idler pulley takes up any belt stretch which may occur in the endless woven canvas belt, without impairing sensitiveness of machine.

Front pulley and upper part of spindle are guarded by a semi-tubular guard insuring safety. Machine may be operated either by hand or foot control.



Height over all.....24"
Base $7\frac{1}{2}$ " x 18"
Diameter of spindle $7/16$ "

Spindle feed..... $2\frac{1}{4}$ "
Weight.....62 lbs.
Will drill to center of a 6" circle.

The High Speed Hammer Co., Inc.
Dept. 14
Rochester, N. Y.

Aurora Sliding Head Drill

Back Gear, Geared Feed, Automatic Stop

**"An Unrivalled Producer"
Say Machine Tool Experts**

This heavy duty high speed Drill affords a wide range of operation, is easy to manipulate, is extremely accurate and a large producer.

Its great productive capacity, due to its heavy pulling power at the drill point, results from the unusually large size of its pulleys and the ratio of gearing.

Its massive design insures equal distribution of all strains and elimination of chatter. Feed box is adapted as lubricating tank—holding enough lubricator for over a month. Area of table arm bearing entirely prevents table from tilting, should bearing remain unclamped—avoids making imperfect holes. Latest Tapping Attachment.



Watch the PULL at the Aurora's drill point

*Here's supreme Drill Press Value at an
unusually attractive price. Write—*

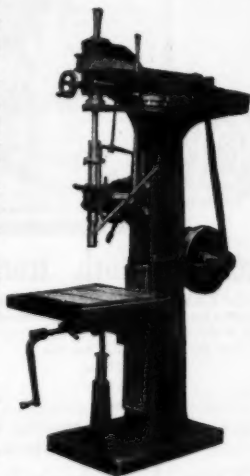
The Aurora Tool Works
Aurora, Indiana, U. S. A.

Avey No. 3

Heavy Duty Ball Bearing Drilling Machine

Designed for quantity and quality production on all classes of drilling. Much higher speeds can be obtained than ordinarily used for holes from $\frac{3}{4}$ in. to $1\frac{1}{8}$ in., which, combined with finer feeds, make a production increase of from 25 to 50% possible.

Built in combinations of one to six spindles with plain hand or power feed. Ball bearings throughout.



Our No. 3 machine provides maximum speeds for work up to $1\frac{1}{8}$ "

Write for Bulletin containing details

The Avey Drilling Machine Co.
Cincinnati, Ohio



Accurate Work from a Heavy Drill

The Rockford Mechanic's Drill is a heavy machine built to stand the strain of continuous accurate service. It has a wide range of speeds and feeds that adapts it to any kind of job going through the shop.

These are its dependable features:

Sliding Head
Back Geared

Positive Feed
Automatic Stop

There is more to the story of this drill. Write us for further details.

Made by the Rockford Machine Tool Company, Rockford, Ill.

Distributed by

The Fairbanks Company

Administrative Offices, NEW YORK

Branch Houses

Albany
Baltimore
Birmingham
Boston
Bridgeport

Buffalo
Chicago
Cleveland
Detroit
Hartford

Newark
New Orleans
New York
Paterson

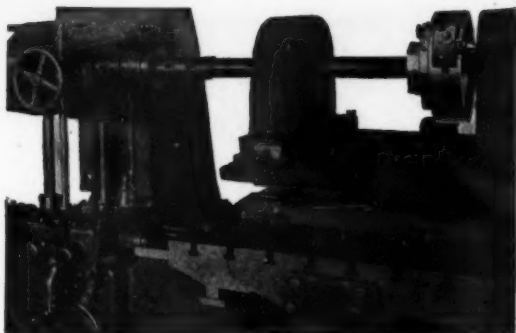
Philadelphia
Providence
Rochester
Scranton

St. Louis
Syracuse
Utica
Washington

The
FAIRBANKS
Company

Fairbanks Locomotives, Tractors & Wheelbarrows, Valves, Engines & Pumps, Excavators, Mill, Sifter & Railway Supplies, Automobile Repair Service, Steel, Machine Blanks, Wires, Machine Tools, Steel Rolling Equipment.





Mummert-Dixon Facing Heads In Operation on a Boring Mill

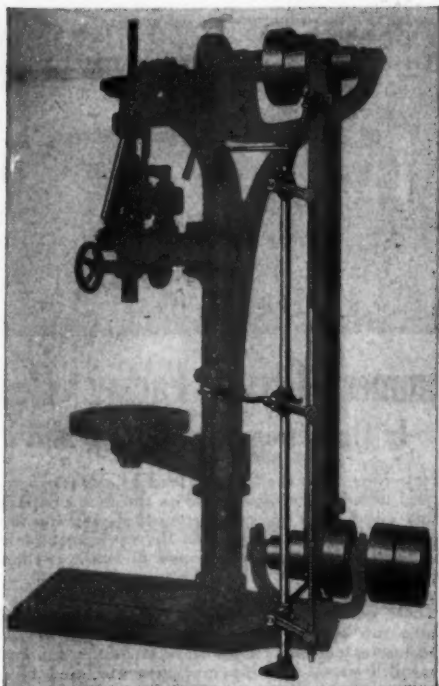
Note how easily the Facing Head adjusts for this work. The tool is fed automatically across the face of the head, working either in or out, completing the operation without change or adjustment. It will do the work accurately and at the same time more quickly and at less cost than any other tool or set-up.

These heads are made in six different sizes, and are available for use on any machine carrying a spindle or that will operate a bar. They work on lathes, milling machines, drill presses, boring machines, etc., and in every case show a decided economy in time used and in the cost of the operation. The ordinary lathe tool is used, and the operation is in effect the same as facing on the lathe.

The virtue in these facing heads is their economy of time and cost. If you will let us, we shall be glad to show you how they can expedite your work and save you money.

Let us have your address, please

MUMMERT-DIXON CO., Hanover, Pa.



Instant changes of speed for
drill presses increase production
and reduce compensation to injured
employees.

Details in Circular H-D

The Kremer-Cummins Machine Company

1833-35 East 55th St., Cleveland, Ohio

Thor

Portable Electric Drills

No. 0
 $\frac{3}{8}$ -inch
Drilling Capacity



Ask for Circular No. 33

Indispensable for all kinds of drilling, reaming and wood-boring in the building of steel and wooden cars, boilers, automobiles, auto bodies and in railroad and structural shops and for machinery repairs.

*Jacobs Chucks furnished as
regular equipment*

Agents Wanted

**Independent Pneumatic
Tool Company**

Chicago, New York, Philadelphia, Pittsburgh, Cleveland, Boston,
Detroit, St. Louis, San Francisco, Birmingham, Montreal, Toronto

Well deserved popularity is a great thing. The

MUELLER RADIAL DRILL

by its all around efficiency has gained for itself the reputation—both with operator and production manager—of being a pretty good tool to have in the shop.

Why, do you suppose, do both operator and production manager think so highly of the MUELLER Radial Drill?

Surely there must be a good reason.

There is.

Ask

The Mueller Machine Tool Company

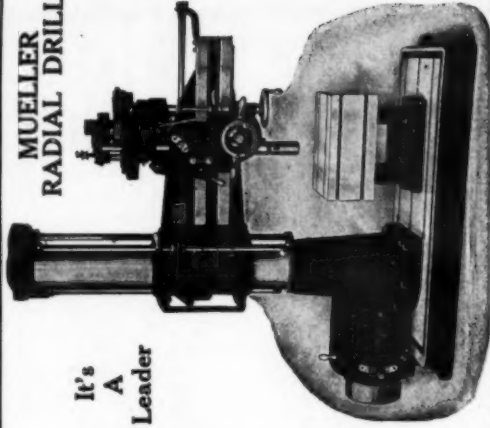
Radial Drills and Lathes.

ESTABLISHED 1902

CINCINNATI, O.

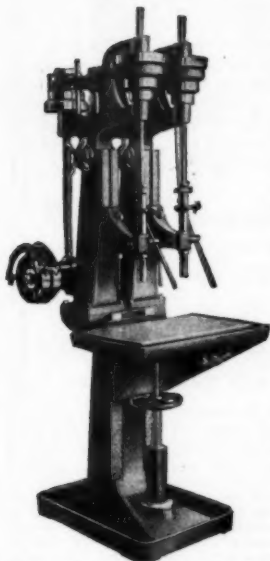
MUELLER RADIAL DRILL

It's
A
Leader



The Edlund Sensitive Drilling Machine

Rigid—Powerful—Economical



The frame is a rugged one-piece casting and has an extra large bearing surface, insuring complete rigidity. The large diameters of cone and drive pulleys afford exceptional cutting power at drill point. Being fitted with ball bearings throughout—ten to a spindle—reduces strain and friction to a minimum and allows easy, silent, velvet motion.

"EDLUNDS" are built in combinations from one to six spindles. Power is transmitted through two bevel gears, a vertical shaft and a straight endless belt. The four speed changes are instantly made without stopping machine.

Combining the best features of the modern drill press with its own exclusive improvements, maximum output at lowest costs is thereby assured.

For complete description send for our illustrated folder

Edlund Machinery Company, Inc.

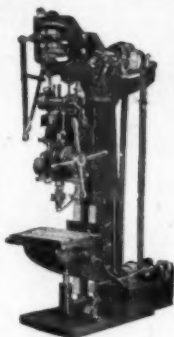
260 Huntington Ave.,

Cortland, N. Y., U. S. A.

At one setting of the work

Turner Turret

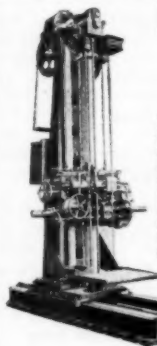
completes a series of operations! Rotation of turret is automatic—when spindle is returned to its full height, it automatically indexes to the next spindle. Its reversing tap holder backs out automatically when the required depth is reached. Cost of duplicate parts is cut deep. Built with 4 to 12 spindles and to order.



Write for bulletin FH

Turner Machine Company, DANBURY, CONN.
and Newark, N. J.

Incorporated with Turner, Atherton & Co., Ltd., Denton, Manchester and Stockport, England



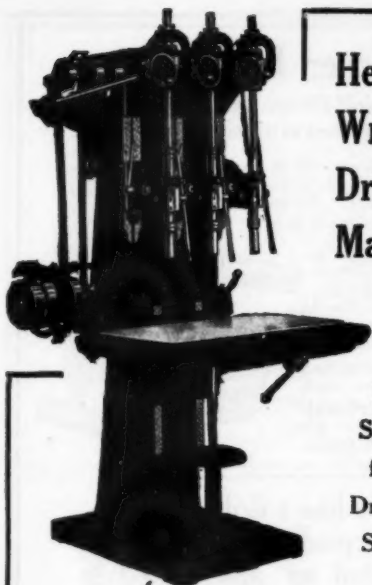
P. & H. Drilling and Boring Machine For Large and Difficult Pieces

This P. & H. Horizontal Drilling and Boring Machine was invented for use in our own plant to drill and bore on long and bulky sections of cranes, hoists and mono-rail pieces—and other parts awkward to handle on the average type of machine. It has emphatically made good for this special class of work. It offers equal value to other firms engaged in the above or similar lines of manufacture. *We are passing a good thing along.*

Speed variations for a. c. current,
12 to 542 r. p. m.; for d. c. 10 to 445.

Tell us about your horizontal drilling problems.
We may be able to help you out. Drop us a postal.

Pawling & Harnischfeger Company
Milwaukee, Wisconsin



Henry & Wright Drilling Machines

with
1 to 8
Spindles
for $\frac{3}{4}$ "
Drills and
Smaller

Business conditions necessitate the closest economy in shop costs. Henry & Wright's, with their gearless power transmission and frictionless bearings, have reduced drilling costs far below the ordinary. There are 252 Varieties to choose from.

Write for Catalog, with scientific FEED and SPEED CHART

The Henry & Wright Mfg. Co.
760 Windsor St., Hartford, Conn.

New York Office, 136 Cedar St.

OVER-SEAS REPRESENTATIVE

ALMACOA **ALLIED MACHINERY COMPANY OF AMERICA** **ALMACOA**
51 CHAMBERS ST. NEW YORK, U.S.A.

Principal Foreign Offices: Paris, Turin, Zurich, Barcelona

They Never Run Hot

**"Standard" Electric Drills
can be pushed to the limit**

An excess of power and an improved method of force-ventilation prevent overloads and burnouts. This enables operator to push them to the limit.

Fool-proof. Operators protected against shock. Built of five simple units, and very light for their high power and great rigidity. Dust-proof ball bearings.

*Let our Engineering Dept.
figure on your needs*

**The Standard
Electric Tool Co.
Cincinnati, Ohio**



**Would you like a drill
that the spindle can
be operated up and
down by a foot lever
as well as by a hand
lever?**

A Foot Lever is very handy when boring wood, hard rubber or hard fibre.

*Send for a circular of
this Drill if interested*

Francis Reed Co.

43 Hammond St., Worcester, Mass.





Have You Ever Noticed

How Few Second-Hand

***Sipp Quick Change Speed
Sensitive Drilling Machines***

Are Offered For Sale?

THERE'S A REASON!

The Sipp Machine Company
Keen Street, PATERSON, N. J.

Invaluable For Drilling Hard-to-get-at Holes



The Harris Offset Drilling Attachment

Attached to ordinary drill presses, it drills, faces and counterbores holes and boms in out-of-the-way places that cannot be reached otherwise. Specially adapted for automobile, railroad and general machine shop work. Saves expensive time and insures superior results.

Various sizes and forms of this Attachment furnished for unusual jobs.

Write for the illustrated Folder O. K.

Harris Engineering Co.
Bridgeport, Connecticut

Minster Jr. Drill

**For Heavy Boring or
Fast Light Drilling.**

The MINSTER is a high grade single purpose drill press of such unusual design that it can take care of many heavy boring jobs usually put on larger drills.

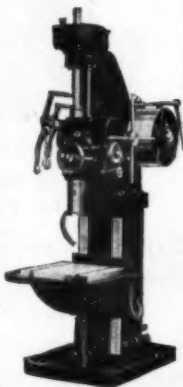
At the same time its six speed and four feed changes make it highly efficient for fast light drilling. Changing gears affords any speed or feed desired.

Ball bearings throughout, high carbon steel spindle and top quality wearing parts insure smooth, silent motion and capacity to stand up under long, hard usage.

Send for Bulletin 30

MACHINE TOOL DEPT.

Minster Machine Co.
Minster, Ohio



DETROIT SEMI-AUTOMATIC DRILLING MACHINE

Keeps the Operator Hustling

Drills Small Holes Quickly and Accurately

A special adaptation of the drill press to meet modern production requirements.

Capacities, 0 to $\frac{3}{8}$ " drills.

Working parts enclosed.

Practically fool-proof.



The specific purpose of the "Detroit" is the fast, easy and precise drilling of small holes in small work. When the drill feeds are given the desired adjustment they operate automatically and it's up to the operator to run the machine to capacity. The horizontal spindles insure maximum speed and simplicity of parts. It is the latest development of the modern drill press to meet the production needs of today and tomorrow.

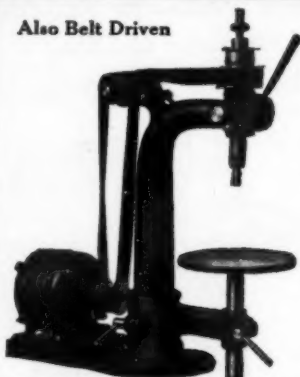
Illustrated Folder and specifications on request.



6525-45 St. Antoine St.,

DETROIT, MICH.

Also Belt Driven



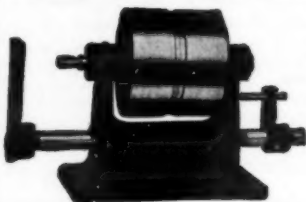
Burke 10" Bench Drill Motor Driven

Extremely accurate, very sensitive and of *Burke Quality*. Has double flanged top cone mounted on large bearing through which spindle runs. Spindle thrust taken on a ball bearing.

Worth more than it costs. Write for full information

The Burke Machine Tool Co.
297 East 16th St., Conneaut, Ohio

Send Samples



or Drawings
of your Tapping
Jobs and let
us give you
Production
Estimate

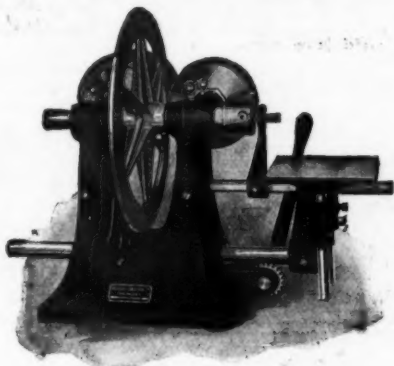
Burke Friction Driven Tapping Machines eliminate all shock to the tap, and for this reason stop 95% of your tap breakage.

Look into your scrap bin and figure up your losses in broken taps and imperfectly tapped work and see what you can save by installing Burke Equipment.

The Burke Machine Tool Co.
297 East 16th St., Conneaut, Ohio

"R-S" Tapping Machines

Do Fast, Exact, Economical Work



Cut shows our $\frac{3}{8}$ " machine. We also make $\frac{3}{16}$ " and $\frac{5}{16}$ " sizes, bench or floor type. Can be direct connected to motor.

These tapping machines are superior in workmanship and design. They are production tools, first and foremost. They have practically done away with tap breakage, and do not require skilled labor to operate. A boy can secure maximum production.

They can tap per hour EIGHTY $\frac{1}{2}$ " holes, $\frac{9}{16}$ " deep. How's that for efficiency?

For speed, accuracy, safety they are unsurpassed.

Write for our Tapping Machine Bulletin describing our full line of Vertical, Horizontal and Radial Tappers

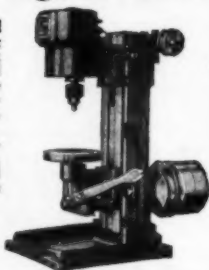
RICKERT-SHAFER CO., 1110 Cherry Street, **ERIE, PA.**

Bicknell-Thomas Friction Driven Vertical Tapping Machine

It taps to the bottom of blind holes without danger of breaking tap. The elimination of all shock when reversing also saves taps and increases output. It is easy to operate, sensitive and highly productive. Capacity, 0 to $3/16$ " taps.

We also make Plain Horizontal Bench Tappers in two sizes, with capacities of 0 to $3/16$ " and $3/16$ " to $7/8$ ". They are high-grade machines, sold at a low figure.

*Write for specifications
and the moderate price*



Bicknell-Thomas Company
90 Wells Street, Greenfield, Mass.



Patented
Jan. 30, 1917

Type 6

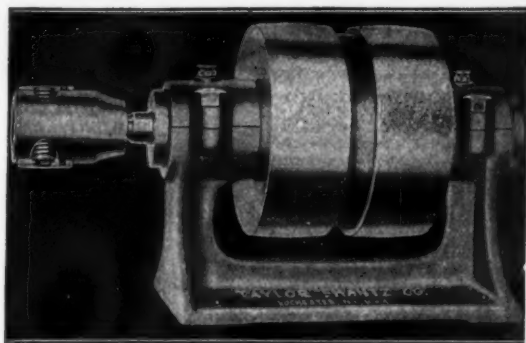
Autex Extension Reel

Previous types have been eminently satisfactory to the user, but the present type possesses additional features that places the "Autex" clearly in a class absolutely exclusive. Our motto has been **GOOD, BETTER, BEST.**

Write for particulars

The Cincinnati Specialty Mfg. Co., Inc.
1913-21 Powers St., Cincinnati, Ohio





T-S Bench Tapping Machine

0 to 5-16" Capacity

**Will save you many dollars
with an outlay of only a few**

Price \$25 Complete

F. O. B. Rochester, N. Y.

**Fully equipped, including Jacobs Chuck.
No Extras. Rapidly taps all metals of
medium thickness with minimum breakage.**

Taylor-Shantz Company

480 St. Paul Street,

Rochester, N. Y.

Madison Boring Cutters and Bars

Save Money in the Tool Room



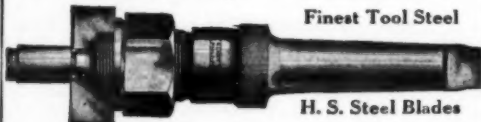
They take the place of reamers and do much better work, insuring absolutely straight finished holes any size required. Made in 45 sizes—from $1\frac{1}{4}$ " to 5" diameter. Adjustable to within .00025 in less than five minutes.

Leading automobile corporations are satisfied users of the MADISON—used also in U. S. Ordnance and Navy Dep'ts.

We'll send them on approval for a thorough trial

MADISON MANUFACTURING CO., - Muskegon, Mich.

Saves High Speed Drill Costs



Finest Tool Steel

H. S. Steel Blades

Alert Boring and Facing Tool

It bores, faces, counterbores and radiuses **LARGE HOLES** where the cost of large H. S. drills is prohibitive. Bores clean, perfect holes 6" deep in one cut. Performs any of above operations on Turret Lathes, Automatic Screw Machines and Drill Presses. Made in three sizes.

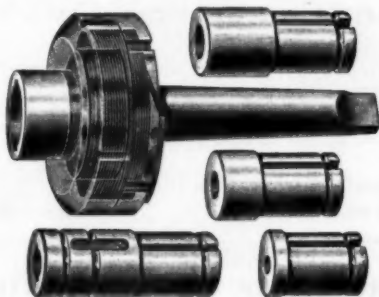
We also offer Improved Ratchet Tap Wrenches, Roller Grip Arbors and Roller Grip Mandrels—**ALL PATENTED**; High Speed Solid Tap Wrenches and Hand Knurling Holders.

Write for our Circular "H"

Alert Tool Co., 237 N. 6th St., Philadelphia, Pa.

THE SAFETY FRICTION DRIVEN DRILL and TAP HOLDER

Cuts Out Tap Breakage



Tap breakage is eliminated because spindle instantly revolves under undue strain. "The Safety" permits tapping to the bottom.

Simply designed and easily operated. It enables you to change from drill to tap, or tap to drill, without stopping spindles. This prevents "lost motion" in changing from drilling to tapping. There is nothing about it to break or get out of order. Made in four sizes—0 to 2½" diameter.

Let it make a big cut in the high cost of your tap breakage.

We solicit a trial order

THE BEAMAN & SMITH CO.
PROVIDENCE, RHODE ISLAND

One Trial Will Convince You That



The EASY-Lock Holder and Counterbore Cutter

is the most efficient tool holder now offered. No wrench, hammer or wedge required. *One twist locks cutter into holder.* Cutters are adjustable and can be used up to a third of their length. Made also to fit screw machines and turret lathes.

Folder on request

Manufacturers Machine Products Co.
1320 Mt. Elliott Ave., **Detroit, Mich.**

Why Waste Expensive Time Over Broken Taps?



Walton Tap Extractor

Takes Ends Out At Once

When a tap breaks the WALTON PATENTED TAP EXTRACTOR cuts out all needless waste of high-priced labor in taking out the broken end by ordinary rule-of-thumb methods. Instead, you merely insert the prongs of this tool into flutes of broken end and one or two twists extracts the piece—easily and quickly. *Here's a real dollar saver.*

You may have one on approval. Your address?

THE WALTON CO., Hartford, Conn.

The Universal Angle Plate

Eliminates Frequent Resetting

**12"x18"
Worm
Adjusting**



**Protected
by Patents**

Made in Four Sizes, 4x6", 6x8", 8x10", 12x18"

You will find it invaluable for insuring quick and rigidly accurate tool room operations. If you have a piece of complex design requiring drilling, milling or other kinds of machining at various angles, much labor and patience must be spent in making the necessary readjustments. The UNIVERSAL eliminates all extra set-ups. It is quickly and easily adjustable to any required angle—horizontal or vertical—without disturbing the piece.

Turns plain drilling, milling, planing, boring, shaping, or grinding machines into Universals. Swivels 360 degrees horizontally and 90 degrees vertically, and has vernier attachment reading to 5 minutes for particularly fine work.

Write for particulars about this big cost saver

Boston Scale & Machine Co.
100 Ruggles St., Roxbury, Mass.



The "Woodstock"

**Saves Many Good Dollars
By Protecting Costly Taps**

It is calculated that 90 per cent of taps break. The WOODSTOCK Improved Patent Safety Tapping Chuck eliminates this needless waste.

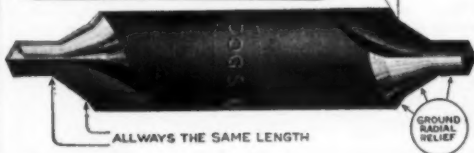
It automatically releases the tap the instant it binds or hits bottom of hole, and a boy easily operates it.

Used in U. S. Arsenals and Navy Yards, and in leading Automobile Plants. Made in five standard sizes.

*Sent on trial on request
Why waste expensive taps?*

Peter Bros. Mfg. Co., 115 Railroad St.,
ALCONQUIN, ILL.

COGS DRILL



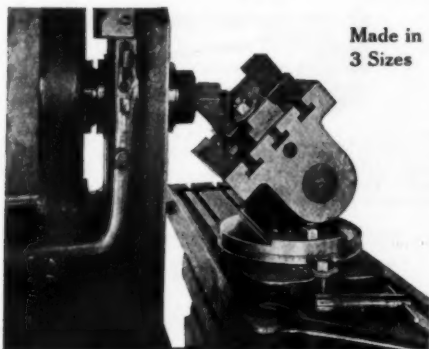
Bell-Type Centredrill

This Centredrill gives you a *uniform length of countersink*, which insures accurate finishing operations. *Prevents banging up the centered end*, which has spoiled many a piece.

Write for Catalog of "Production-Increasing Tools"

Cogsdill Manufacturing Co., Detroit, Michigan
Originators of the Ground Radial Relief Centredrill

The Reid Universal Angle Fixture



Made in
3 Sizes

As a time and labor saver in machine shop output it is a proven pacemaker. It is not only rapid, accurate and adaptable, but is besides so massively designed that it stands up under the heaviest and toughest wear and tear. This cuts out chatter and distortion.

"The Reid" is so simply and perfectly built that error is impossible, even by an inferior workman. It swings 360 degrees horizontally, 180 degrees vertically, and allows practically every compound angle. Exact adjustments are made by double vernier to within $1/12$ of a degree either way from central position. Still finer adjustments provided by sine bar attachment. Vertical adjustments made by gear and pinion wrench.

Why not get further data about this superior tool?

Reid Bros. Co. 59 Park St.
Beverly, Mass.

Export Department, 77 Broad St., New York City
English Agents, Oliver Machinery Co., Ltd., 201-03 Deansgate, Manchester, Eng.

Also Manufacturers of the Reid Surface Grinder

Whitney ^{Ball Bearing} Punch No. 10

Lightest, fastest, easiest working tool made
for punching sheet metal, angles, etc.



Capacity $\frac{3}{8}$ "
through $\frac{1}{4}$ " metal

With the elimination of friction, all the energy applied to the levers is transmitted to the punch. This permits a thread pitch impossible on any other punch, placing this tool *in a class by itself*. The spindle and drop-forged frame are made of special steels and heat treated. All parts made to jigs and interchangeable.

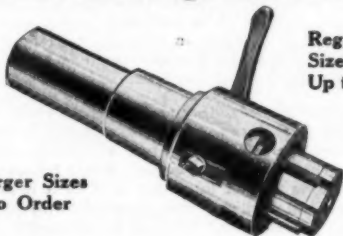
Write for description and our punch price list

Whitney Metal Tool Co.

109-111 Forbes Street,

Rockford, Ill.

Victor Collapsible Taps



Regular
Sizes
Up to 6"

Larger Sizes
to Order

These durable and efficient tools cut clean, sharp threads easily and rapidly. Unlike solid taps, the inserted chasers can be ground and adjusted up to $\frac{1}{32}$ " under or over size. They reduce tapping time **Fifty Per Cent**.

Here's a fine chance to cut tapping costs

VICTOR TOOL COMPANY, - WAYNESBORO, PA.

No Air and No Wrench Needed

With the Barker Wrenchless Chuck

But it will increase production from 30 to 150 per cent! Just one pull on the lever and the piece is chucked—could anything be simpler?

The grip of the "Barker" is enormous, and yet, any desired pressure may be set at the touch of the operator. The jaws may be operated whether the chuck is revolving or still.

Send for one and see how it will turn wrenching and adjusting time into actual production time.

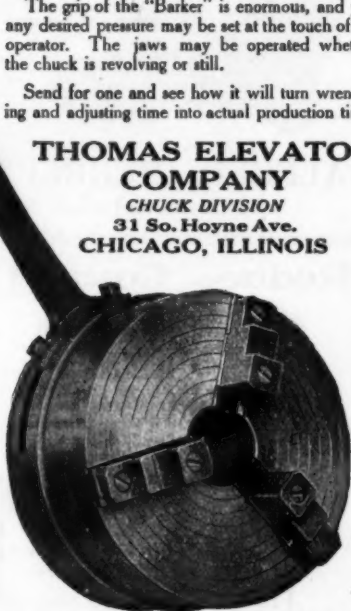
THOMAS ELEVATOR COMPANY

CHUCK DIVISION
31 So. Hoyne Ave.
CHICAGO, ILLINOIS

Sizes,
6" to 16"
Made with
2 and 3 jaws

Centers
Automatically

*Catalog
on request*



Why not use the *MODERN* method of chucking?

Coventry Chucks



The strongest on the American market as to gripping power, protection from breakage and freedom from harmful wear. All working parts enclosed to keep out dirt and keep the lubricant in. Made in sizes of 9 to 25-inch diameter.

Write
for Bulletin
No. 201

ALFRED HERBERT Ltd.

54 Dey Street, New York

14

Reduce Costs 3-to-1



Sellew Adjustable Drill Heads

make *three* holes
in the time of one,
a saving that's well
worth while in these
times.

We also make *Special Heads* with
fixed spindles to
suit your require-
ments.



Let us help you to lower drilling costs

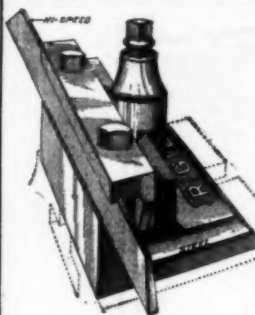
SELLEW MACHINE TOOL CO., Pawtucket,
Rhode Island

Jacobs Chucks

The use of a product in ever widening circles is incontrovertible evidence in favor of the quality of both product and service. The increasing demand for Jacobs Chucks is a case in point.



The Jacobs Mfg. Co.
Hartford ~ Connecticut.



BACK-STROKE

Cutting - Off

TOOL

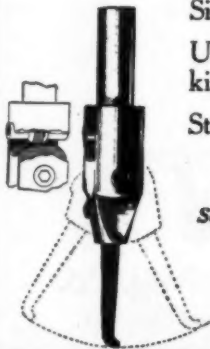
100% more work
and better work

Right hand or left. Gets up close to chuck. Blade always erect and cuts off hard tool steel under Automatic Cross Feed.

Sold on approval

RIGID Tool Holder Co.
Washington, D. C.

E-Z-SET Boring Tool



Simplest and Best.

Use for Boring of any kind, anywhere.

Straight or Taper Shank.

4 SIZES

5/16, 3/8, 1/2, 5/8" Tool Bits

Sent on 10 days' approval

THE
B. & W. Tool & Die Co.
102 St. Clair Ave., N. W.
CLEVELAND, O.

McCrosky



McCrosky - Super Adjustable Reamers

for

Long Service Efficient Service

They cut the cost and improve the finish
of every hole they ream.

Send for McCrosky Catalog No. 7

McCrosky Tool Corporation

Meadville, Pa., U. S. A.

Branches and Agencies in all principal cities

Export Agents: Benjamin Whittaker, 21 State St., New York, N. Y.

COST CUTTING TOOLS

Floor Walkers Waste Money



Nothing is so costly in a shop as waste steps, and nothing saves so many wasted steps for its cost as the—

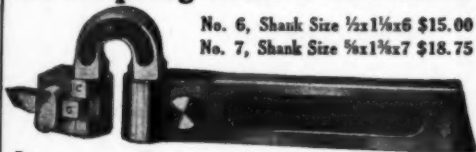
"Champion" Portable Tool Stand

It takes the tools, vise and bench to the work, saving so many idle steps and mislaid tools that it pays dividends on its moderate cost almost before you know it.

*Write for Catalog No. 18
It's full of economy
devices*

Western Tool & Mfg. Co., Springfield, Ohio

Cleveland National Spring Head Tool Holder



No. 6, Shank Size $\frac{1}{2} \times 1\frac{1}{2} \times 6$ \$15.00

No. 7, Shank Size $\frac{3}{8} \times 1\frac{1}{2} \times 7$ \$18.75

For
Broaching,
Cut-off,
Forms,
Gauges,
Keyways,
Radii,
Taps,
Worm or
Square
Threading,
Etc.



Write for
30 days'
trial offer

ALSO
Circulars
of other
Modern
Tool Room
Specialties

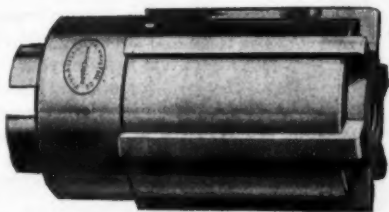


The Cleveland National Machine Co.

Dept. T. L., Cleveland, Ohio

The Cashman Adjustable Reamer

Outlasts 15 to 20 Solid Reamers



It is unsurpassed for simplicity of design, superior wearing quality, and maximum efficiency in production. There are *only three parts*: Socket, Adjusting Screw and Lock Collar—all interchangeable. Built of high grade materials. Blades are made of H. S. steel and can be renewed and used their entire length of adjustment.

Makes the heaviest cuts in the hardest metals and stands up continuously under the toughest usage. All adjustments are made by one adjusting screw, from 1-16" to .0001" as required.

The CASHMAN cannot change its size in the hole.

Let us send you one for a trial at our risk. Your address?

Cashman Tool Company
Waynesboro, Pa.



The Handiest Tool in the Shop

The Canton Portable Crane and Hoist has a place in your plant for reducing handling costs. One man operates it and its applications are innumerable.

Send for Catalog E-3

**Canton Foundry
and Machine Co.**

Canton, Ohio



Straight Shank Turning Tool



Boring Tool



Straight Shank Cut-off Tool

Armstrong Tool Holders

Make One Pound of High Speed Steel go as far as Ten Pounds in Forged Tools.

Grand Prize Winners at
Panama-Pacific Exposition.

Complete Catalog Free.



Armstrong Bros. Tool Co.

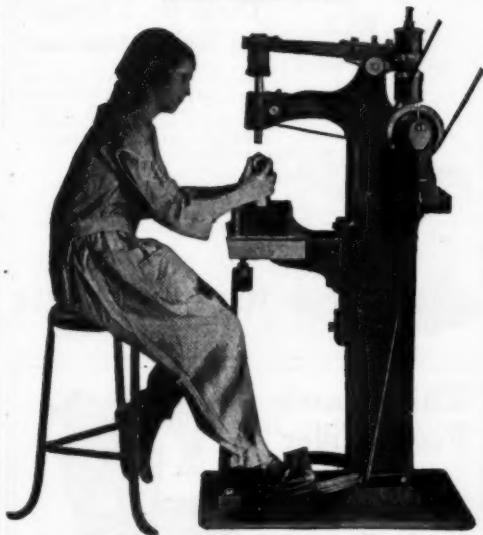
"The Tool Holder People"

308 N. Francisco Ave., Chicago, U. S. A.

Riveting Revolutionized

"The Hammer with the human stroke"

Heads Rivets Cold



Heads 'em tight or loose, flush, countersunk, or finishes heads any shape desired at the rate of:—

A rivet a second, sizes up to 3-16 in.

A rivet in two seconds, sizes 1-4 to 3-8 in.

A rivet in three seconds, sizes 7-16 to 5-8 in.

Built in Eight Sizes

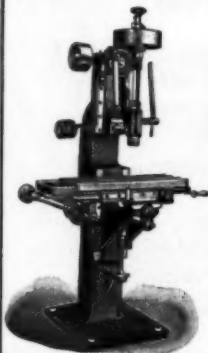
To handle rivets from the smallest, up to 1½" in diameter. Send us sample assembly parts with rivets or sketch of your work, and let US shoulder your riveting problems.

Send for the High Speed Hammer Book

Department 13

The High Speed Hammer Co., Inc.
Rochester, New York

An Economy Milling Machine



Clough No. 2 Vertical with Slotting Attachment

Specially adapted for blanking dies, die sinking, metal patterns and light machine work. Has six speeds with automatic feed. The Slotting Attachment has stroke of $4\frac{3}{4}$ " and adjustable slide. Rapid, accurate, adaptable.

Size of table.....	28" x $9\frac{3}{4}$ "
Lengthwise auto feed.....	21"
Cross motion.....	9"
Vertical adjustment.....	15"

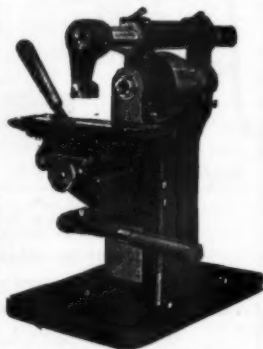
Our Catalog on request

R. M. CLOUGH
Meriden, Conn.

This Hand Feed Miller \$155.

**Save Power—Save Room
Save Money**

That is what you do when you install Burke Milling Machines, as they take less power, need less factory space, and on account of the convenience in operation your small milling operations can be done much more rapidly than on a larger, heavier type machine.

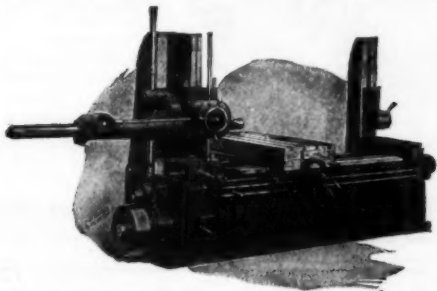


Write for Catalog, which also shows larger and smaller sizes.

The Burke Machine Tool Co.
297 East 16th St., Conneaut, Ohio

The Lambert Horizontal Boring, Milling and Drilling Machine

**Extremely Simple—Wonderfully Accurate
Under Quick and Easy Control of Operator**



Extreme simplicity and precision are the salient features of this modern machine, combined with unusual convenience and productiveness. Quickly controlled by two levers which slide along the horizontal bars—one starts, stops or reverses any feed, and the other starts or stops the bar.

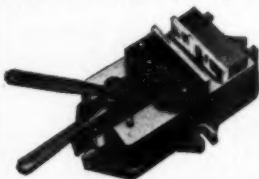
Bronze bushings and steel gearing used thruout the machine. It is arranged so left hand millers and cutters may be used when required. Bed permits operator to get close to his work. Construction of head affords greater range for boring or milling from table to center of bar. Spindle head enables both facing and boring to be done at the same time. Verniers furnished for table cross feed on request.

Make its better acquaintance. May we send Folder?

Carroll Foundry & Machine Tool Co.

Bucyrus, Ohio, U. S. A.

"The Hartford" Quick Acting Milling Vise



Rapid—Rugged

Jaw width.....5 in.
Jaw Depth.....1 1/4 in.
Weight.....40 lbs.
Maximum opening of Jaw
3 1/2 in.

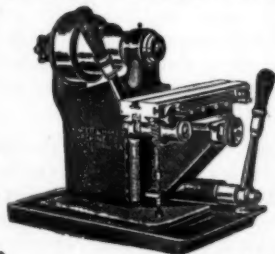
It affords maximum dependability, efficiency and economy.

It stands up day after day under the heaviest, toughest strain of milling jobs. Has quick fire adjustment. Outlasts five ordinary vises. One firm after a try-out gave us a straight order for thirty-two more.

Write for full description

The Hartford Special Machinery Co.
285 Homestead Ave., Hartford, Conn.

Just The Machine



for those light cuts on details for Fire-arms, Sewing Machines, Typewriters, Bicycles, Electrical work, and a thousand and one other details used in the manufacture of the various products of the manufacturing world.

Send for descriptive circular

The Carter & Hakes Machine Co.
West Winsted, Conn., U. S. A.

AGENTS—for New England and New York, Hill, Clarke & Co.
WESTERN AGENTS—Marshall & Huschart Machinery Co.,
Chicago, St. Louis, Indianapolis.

**You waste no
time getting
the exact
angle** →

The tilting table,
with accurate
graduations in de-
grees, always
helps to speed up
the work.



Why waste tool room time?

SAVE those golden minutes by installing Knight Milling and Drilling Machines. They have the convenience, speed and accuracy that enable your high-priced skilled machinists to do better work in less time. They also help to solve difficult machining problems. Made in four sizes.

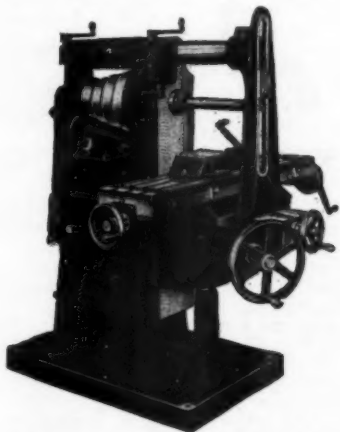
*Glad to send you our illustrated folders
and to help you select the right machine.*

W. B. Knight Machinery Co.
3920 W. Pine Blvd., St. Louis, Mo.

**They mill, bore
and drill at
any angle with
only one set-
ting of the
work.**



You Can't Beat the
AMERICAN No. 1½ PLAIN **MILLER**
BACK GEARED
For Maximum Quality Milling



The AMERICAN embodies all the latest exclusive improvements which make it an unusually high grade milling machine. Its massive design enables it to take care of all the heaviest strains. Its bearings are wide, and all operating levers are convenient to operator. Ample lubrication. Eight modern machine accessories regularly furnished.

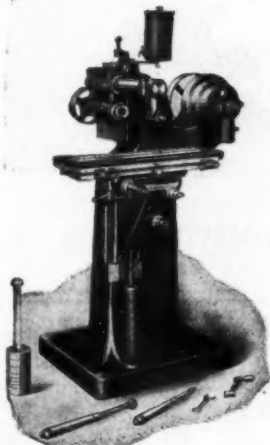
Swiveling Vertical Milling Attachment furnished, if desired, for all kinds of vertical milling.

Get the specifications and look them over

The American Milling Machine Co.
Cincinnati, Ohio, U. S. A.

U. S. No. 1 Improved Miller

**Offers Exceptional Milling Efficiency
Combined With Utmost Economy**



**Hand
and
Weight
Feed**

**Adaptable
for
handling
heavy
work**

The remarkable adaptability, economy and productive capacity of the U.S. No. 1. Improved Miller demonstrates the wastefulness of employing large heavy duty millers for the milling of small pieces. It has more power than any similar machine of its size.

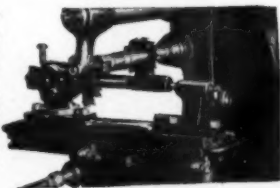
Vertical and horizontal feeds are independent and permit work being held close to table, so that it may be used as a profiler. The vertical lever feed being independent from the table and the head accurately counterbalanced, light milling work can be done on long or heavy pieces without danger of breaking cutters.

It will well repay careful investigation

**The United States Machine Tool Co.
Cincinnati, Ohio, U. S. A.**

The Whiting & Comstock
Semi-Universal Dividing Head
Multiplies the Value of Hand Millers

It turns your hand miller into a **UNIVERSAL MACHINE** at small cost. This enables you to mill cutters, reamers, counterbores and similar small work quickly and accurately. In this way large heavy duty Universals are reserved for purely big jobs.



It offers worth-while economy. Write us today

WHITING & COMSTOCK, 32 Union Place, HARTFORD, CONN.
 Export Department, 77 Broad St., New York City

Relieves and Replaces Big Millers

Davis Milling Attachment
Does 90% of the Small Jobs

Converts
any Drill
Press from
14 to 42-in.
swing in
2 Minutes

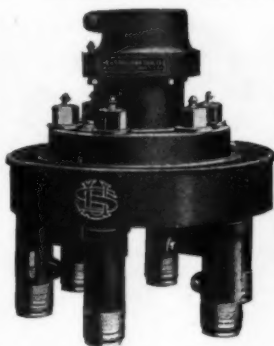


Relieves your large millers, comes in handy spotting castings, milling ends of bosses, etc., and does 90% of the lighter jobs as well as a \$1,000 machine; cuts keyseats perfectly. We also have low factory prices on our cylinder reamer for reboring the Ford car, and on our reliable air compressor. Write for details.

Hinckley Machine Works, **HINCKLEY, ILL.**

**U. S. Patent Adjustable
Multiple Spindle Drill Heads**

Unsurpassed on Big Drilling Lay-Outs



Spindle units
quickly attached,
or removed, to suit
the work in hand.

Fixed Spindle
Heads of any
practical type made
to order.

The conspicuous feature about the U. S. Multiple Spindle Drill Head is its **PATENTED** Double Adjustment of Spindles. Not only symmetrical lay-outs, but also holes in practically every conceivable line or formation—regular or irregular—can be easily and rapidly handled.

They are so rigid and powerful that the same speeds and feeds can be used with them as is employed for drilling a single hole. This means output is increased in direct ratio to number of units attached to head.

Nos. 1, 2, 3, and 3-A have from two to six spindles. Special Adjustable Heads built to order. No. 4 has four spindles, with single adjustment, for drilling evenly spaced holes in groups of four for pipe-fittings, flanges, etc.

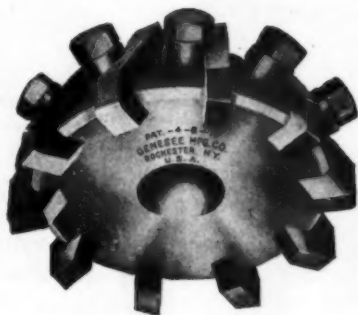
Send for complete specifications and prices

The United States Drill Head Co.

Cincinnati, Ohio, U. S. A.

Genesee Tools Assure You

Genesee Face Milling Cutter



This FACE MILLING CUTTER is a top-notch in every way—built for the strenuous life and plenty of it. The body is made of Chrome Nickel Steel. Blades are set at an angle of 15 degrees, and actually curl chips when cutting. Has large, strong blades. For instance: 4" size has $\frac{1}{4}$ " x $\frac{5}{8}$ " blades. No tool bits used to spring and chatter. Can be used for boring, as cutting edge clears lock screws. With this Mill you can take heavier cuts with increased feeds, *thereby increasing production.* Sizes from 4" up.

They save tool and operating costs and

Genesee Manufacturing Co.

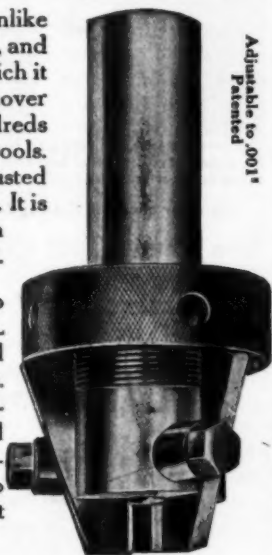
Manufacturers of Adjustable Hollow Mills, Facing Mills, and

e Yu of Greater Economy

Genesee Adjustable Hollow Mill

The "GENESEE," unlike solid tools, is adjustable, and the fourteen sizes in which it is made enable it to cover the work done by hundreds of non-adjustable solid tools. It can be quickly adjusted to the 1000ths of an inch. It is more ruggedly built than the ordinary solid tool.

It enables machines to produce to their FULL capacity. It cuts steel up to 15" per minute. One set of blades outlasts up to five solid tools and are easily replaced. Never clogs up with chips and cannot change in size.



Adjustable to .001"
Patented

and use output—why not make them your own?

D. Inc., - Rochester, N. Y.

g, and Inserted Tooth Face and Side Milling Cutters

It Eliminates "That One Thick Tooth"
the Risk of



The
RED-
E

The RED-E Milling Dog and Driver insures correct spacing because the ball sliding in grooved jaw compensates for the different angle in the driver at various positions of work.

Dog cannot get loose, and there is no binding, cramping or lost motion. No adjustment of dog needed for correct milling of odd pieces. In gear cutting the risk of "one thick tooth" is eliminated.

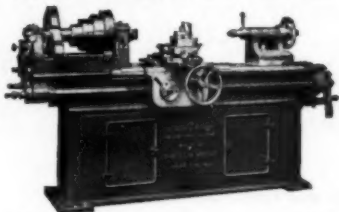
Send for complete Catalog No. H of RED-E Tools

The Ready Tool Co.
Bridgeport, Conn.



Universal Relieving Machine

Drawings, patterns, tools, castings, and
SAMPLE MACHINE FOR SALE



Capacity 14" diam. by 39" between centers. Relieves all types of cutters, taps and hobs, straight or spirally fluted. Many machines in successful operation.

Apply:—A. MORRIS THOMSON, Hanerdon & First Streets
HARRISON, N. J.

Pay Only for the High-Speed Steel that CUTS

MOBACK CUTTERS

With Inserted and Adjustable Blades



Moback Face Mill
(Patent pending)

The first cost is less than that of solid cutters, for only the blades are high-speed steel. The frame is high-grade carbon machine steel, and all parts are ground to gauges.

The renewal cost is only a fraction of that of solid tools, because (1) the frame is used indefinitely, (2) the blades are adjustable for *twice the wear* of solid cutters, and (3) you get a new cutter by simply changing the blades.

THE MOBACK FACE MILL, shown in the illustration, is highly efficient, thoroughly dependable, and so economical that it makes the use of solid cutters a reckless extravagance.

THE MOBACK END MILL is made on the same principle, for the same excellent results. THE MOBACK SIDE MILL also has the inserted blades, and can be used in pairs, or separately, or in combination with gang cutters. All Moback Cutters *multiply the buying power of your dollar four to six fold* in the purchase of RESULTS.

May we post you fully, for ECONOMY'S sake?

Moback Tool & Machine Mfg. Co.
330 Atlantic Ave., Boston, Mass.

Why Reduce Your Production

and waste money by using cheap, inaccurate Index Centers, when a few dollars more will buy a **DICKOW INDEX CENTER**, which is absolutely dependable, and guaranteed for its high degree of accuracy.



**PROMPT
DELIVERY**

Stood the
test for
14 years



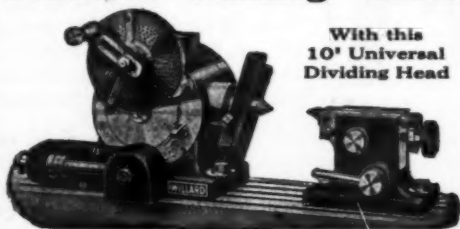
Over 2000 satisfied users
all over the world.

Your old Index Centers
taken in trade.

Also Manufacturers of "DICKOW SUPERIOR EIGHT" Precision Lathes
Dependable and Accurate. Write us today for complete description

FRED. C. DICKOW MACHINERY CO., Not Inc.
3504-3512 W. Lake St., CHICAGO, ILL.

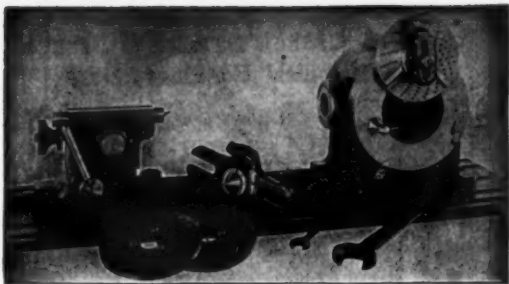
Reduce Milling Costs



With this
**10' Universal
Dividing Head**

Built in very liberal proportions. Easily handles the heaviest cuts encountered on a plain miller. Graduated swivel head can be set anywhere from 10 degrees below the horizontal to 10 degrees beyond the vertical. Worm wheel and index pin are relieved of all strain by means of an efficient locking device.
Write for details.

THE WILLARD-MIDDLETOWN MACHINE CO., Cincinnati, O.
Successors to The Willard Press & Tool Co.



Plain Index Centers Swing 10" Diam.

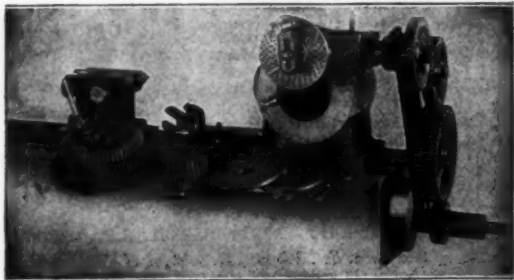
SIMMONS OF ALBANY

These Dividing Heads or Index Centers may be used on any milling machine; are well designed; materials are the finest obtainable.

The Universal Index with Spiral Cutting Attachment is a quite recent development and will be found remarkably useful in any tool-room. Let us tell you more about these accessories.

SIMMONS MACHINE CO., Inc., ALBANY, N. Y.

BRANCHES: 801 Singer Bldg., New York, 86-88 Exchange St., Buffalo, N. Y.
Albany and Buffalo Warehouses



Universal Index Centers with Spiral Cutting Attachments

Giant Universal Joints Are "Whales" For Heavy Duty



Efficient to
an angle of
45 Degrees

Vanderbeek
Universal
Ball Joints
for higher
angle drives

Sizes $\frac{1}{2}$, $\frac{3}{4}$, 1 , $1\frac{1}{8}$, $1\frac{1}{2}$,
 $1\frac{3}{4}$, 2 , $2\frac{1}{2}$ and 3 in.

Built for use in the driving mechanism of powerful, high speed machines. Wearing contacts are of hardened steel and large diameters. Stem ends are braced up to and over the line of strain. Self oiling and dust proof.

Put your angular drive problems up to us

Ainslie Machine & Tool Works

Successors to Vanderbeek Tool Works
HARTFORD, CONN.

COOPER UNIVERSAL JOINTS FLEXIBLE COUPLINGS

**"You Can't Break Them
Or Wear Them Out"**



Smooth exterior.
Neat appearance.
5 Simple parts.
Large oil space.
Working surfaces
case hardened.
No limit to size.



PATENTS

Guaranteed stronger than shaft at any angle.

Joints already bored to fit your shafts from $\frac{1}{4}$ " to 2" carried in stock for immediate delivery.

Ask us to send you one for inspection and test.

Cooper Flexible Transmission Co., Inc.

8th Ave. & 18th St., Brooklyn, N. Y.

OVER 50,000 MILES
NOW REPORTED ON

“WHITNEY”

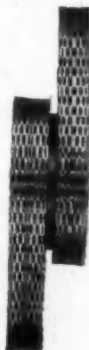
High Efficiency

FRONT END
MOTOR CHAIN DRIVES
AND STILL IN GOOD CONDITION

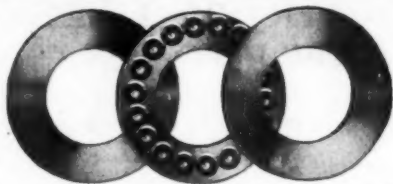


Not one of these
chains has been
known to skip a
sprocket tooth.

Interchange-
able on the
Sprockets
Furnished
with the Car



The Whitney Mfg. Co.
HARTFORD, CONN.



THRUST BEARINGS

FLAT OR GROOVED RACES

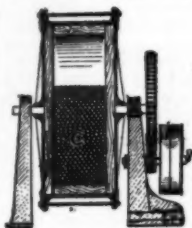
from 1/4" SHAFT DIA., UP

ONE BEARING—OR ONE THOUSAND

THE GWILLIAM COMPANY

23 FLATBUSH AVE., BROOKLYN, N. Y.

Save—Save—Save
75% and Up of Buffing Costs



The Abbott Burnishing Barrel

burnishes by the wholesale at a saving of 75 to 99 per cent over buffing one piece at a time. The quality of the work is superior, without bending, breaking or marring anything. "The Abbott Process" is scientifically developed to the point of perfect burnishing service.

*Write for copyrighted Booklet and send samples for burnishing
 All sizes of burnishing balls and soap chips for prompt delivery*

The Abbott Ball Company
 Elmwood District, Hartford, Conn.

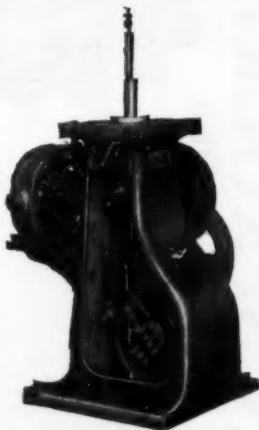
The Catlin No. 8 Keyseater

Greatly Reduces Keyseating Costs

**Simple
Rapid
Productive**

**Cuts Keyseats
1-16" to 1½"**

**Stroke Adjustable
Up to 13"**



Simplicity, ease of operation and maximum quantity and quality of keyseating are the chief merits of the CATLIN NO. 8.

The crank motion enables the cutter to enter the cut at the slow part of the stroke. This is much preferable to the ordinary rack and pinion where the rate of travel does not vary.

It carries ½" to 1½" diameter cutter bars, which are self-contained and have the tool relieving and feeding mechanism.

On some jobs pieces can be keyseated right along without clamping down work or stopping machine.

When belt driven, a 3-step cone provides **THREE SPEEDS.**

Full details gladly furnished on request

Chattanooga Machinery Company
Chattanooga, Tenn.

CULLMAN SPROCKETS

STOCK AND TO ORDER



Diamond, Whitney, Baldwin, Duckworth and
Coventry Chains, Block, Roller and
High Speed Silent types on hand



CATALOG

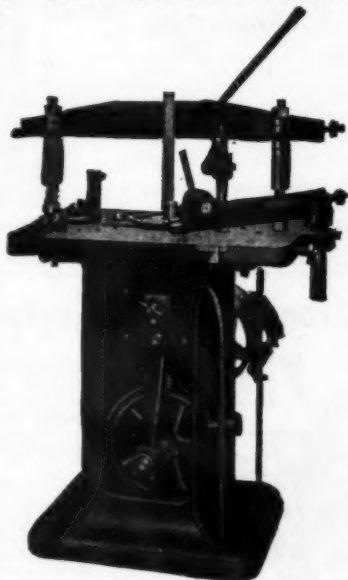
CULLMAN WHEEL CO.,
1359 ALTGELD STREET

CHICAGO

Davis Keyseaters

**Are as much a part of the equipment of any
shop or tool room as a lathe or shaper**

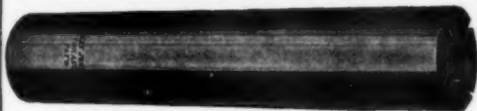
They save time and labor, which is the essential thing in keeping the cost of production down in these days of high labor costs, and they save the big machines for the big jobs.



Made in two sizes

Send for pamphlet

Davis Machine Tool Co., Inc.
Rochester, N. Y., U. S. A.



"Wear-Ever" Woodruff Chuck And Keyway Cutter

The "Wear-Ever" Woodruff Keyway Chuck insures a positive drive and true-running cutter. Eliminates making collet chucks. Fits all standard makes of milling machines, and is made in all tapers, such as Brown & Sharpe and Jarno tapers.

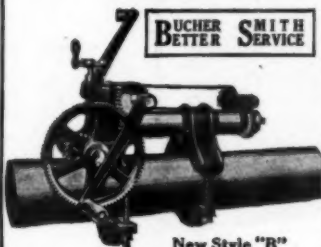
Let us supply you with cutters

No extra charge for the square



SCULLY-JONES & COMPANY, 555 Railway Exchange Bldg.,
CHICAGO, ILL.

A Strong Portable Keyseater



New Style "B"

This handy little tool is easily taken to the job and does the work quickly, accurately, and at minimum cost—it saves labor and money.

Style "B" has six milling cutters and cuts keyways from $\frac{1}{4}$ " to 2" wide, in shafting 2 in. to 8 in. in diam. and 12 in. long without re-setting.

Our tools aid production—send for the Catalog

THE BUCHER-SMITH CO.
East Liverpool, Ohio

High Speed Woodruff Keyway Cutters



STOCK SHIPMENTS

No.	Diameter	Thickness	Shank	High Speed
1	1-2"	1-16"	1-2"	.75
2	1-2	3-32	1-2	.75
3	1-2	1-8	1-2	.75
4	5-8	3-32	1-2	.90
5	5-8	1-8	1-2	.90
6	5-8	5-32	1-2	.90
7	3-4	1-8	1-2	1.05
8	3-4	5-32	1-2	1.05
9	3-4	3-16	1-2	1.05
10	7-8	5-32	1-2	1.30
11	7-8	3-16	1-2	1.30
12	7-8	7-32	1-2	1.30
A	7-8	1-4	1-2	1.30
13	1	3-16	1-2	1.75
14	1	7-32	1-2	1.75
15	1	1-4	1-2	1.75
B	1	5-16	1-2	1.75
16	1 1-8	3-16	1-2	2.00
17	1 1-8	7-32	1-2	2.00
18	1 1-8	1-4	1-2	2.00
C	1 1-8	5-16	1-2	2.00
19	1 1-4	3-16	1-2	2.50
20	1 1-4	7-32	1-2	2.50
21	1 1-4	1-4	1-2	2.50
D	1 1-4	5-16	1-2	2.50
E	1 1-4	3-8	1-2	2.50
22	1 3-8	1-4	1-2	2.75
23	1 3-8	5-16	1-2	2.75
F	1 3-8	3-8	1-2	2.75
24	1 1-2	1-4	1-2	3.25
25	1 1-2	5-16	1-2	3.25
G	1 1-2	3-8	1-2	3.25
26	2 1-8	3-16	No	3.00
27	2 1-8	1-4	No	3.10
28	2 1-8	5-16	No	3.20
29	2 1-8	3-8	No	3.30

E. LAGERHOLM COMPANY, INC.
 9 So. Clinton St., CHICAGO

KEYSEATS Are ESSENTIAL

How are you getting yours?
Circular O will lead you in
the right direction.

Ask for it

National Machine Tool Co.

2266 Spring Grove Ave.,

Cincinnati, O.



These STAGGERED TEETH



(Section of Velco Broach)

Permit More Chip Room and Make
—the “Velco” Cutter Bar the only *Scientific*
Broach made for cutting keyways.

Other
Broaches

Round—Spline—Square

Same
Quality

Velco Manufacturing Company, Inc.

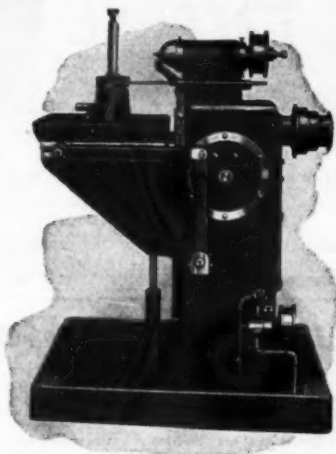
Wells St.,

Greenfield, Mass.

Ask for our Bulletin on Broaching

—those tractor gears

Are now successfully rounded on a production basis with the "Cross"



THIS PATENTED Gear Tooth Rounder does correct work at the profitable rate of 25 teeth a minute.

Every tooth is guaranteed to be a perfect half circle from tip to root—the only perfect shape for sliding mesh gears. Other forms, such as starter-ring and pinion forms, can also be rounded.

The "Cross" will help you keep manufacturing costs down to bed-rock

Cross Gear & Engine Company

Detroit, Michigan

Patented here and abroad; sold **ONLY** by us



Thorofine GEARS

NOTHING TOO SMALL - NOTHING TOO INTRICATE

THOROFINE GEARS ARE GEARS OF EXCEPTIONAL ACCURACY.

LARGE GEARS

Made with the same care that has given Thorofine small gears their unusual reputation. Our Quotations will interest you. Write today.

MERKLE-KORFF GEAR CO.

Formerly Modern Tool & Stamping Co.

313 So. Clinton St.,

Chicago, Ill.

Tung - Stel - Bath

A quenching medium for hardening Tungsten or High Speed steels composed of scientifically prepared chemicals in lump form.

This material when placed in an iron pot and heated will melt at a very low temperature.

High Speed steel may be heated to the maximum temperatures and quenched in Tung-Stel-Bath, primarily heated to a temperature as high as eleven hundred degrees Fahr.

ADVANTAGES ATTAINED BY THE USE OF TUNG-STEL-BATH:-

Maximum hardness and toughness.

Eliminates the necessity of drawing the temper in a great many instances.

Obviates the necessity of sand blasting entirely.

Prevents cracks due to hardening strains.

No more oxidization.

No more oil carbon deposit.

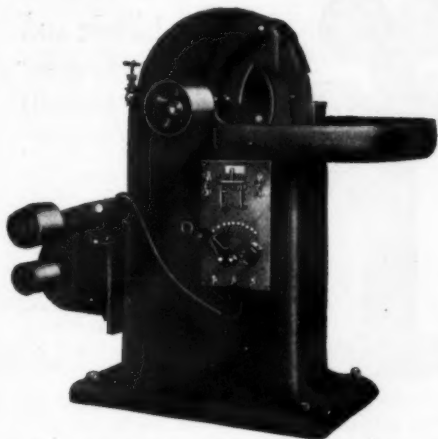
Tools quenched in Tung-Stel-Bath are as clean after hardening as they were before being placed in the fire.

Write today for full information.

Bennett Metal Treating Company
Elmwood, Connecticut

Ransom Motor Driven Water Tool Grinder

Eliminates Splashing



This latest and most modern type of Water Tool Grinder completely obviates the usual disadvantages of ordinary wet grinders—does not throw water over the floor and operator. Instead, the water is conducted by centrifugal blower to the exact spot where the piece is being ground and there is no musing or splashing.

Water tank holds several pails of water. There is also a large settling compartment for receiving sediment which can be quickly cleaned out with a shovel. Ample guards. Motor or belt drive. Size of wheel, 20" by 1½".

Write for details covering our complete line

Ransom Manufacturing Company

Oshkosh, Wisconsin, U. S. A.

Wet and Dry Grinders, Heavy and Light, Motor and Belt Drive

La Salle Grinders

TIME-SAVING TOOLS FOR both PRECISION AND PRODUCTION



No. 1 Plain and Surface Grinder (Micrometer Adjustment)

Grinding wheels.....8"x1"
Between wheels.....15"
Height to spindle center.....40"
Table surface.....8"x14"

Has vertical travel of 12" on guides, $\frac{3}{4}$ " by micrometer, and may be raised to within 2" of spindle center. Wheel grinds to center of a surface 3" wide.

Spindle speed.....3,000 r.p.m.
Countershaft speed.....1,000 r.p.m.
Floor space.....18"x24"
Net weight.....300 lbs.

This No. 1 Plain and Surface Grinder was designed for general use in both tool room and machine shop. It combines the cream of our experience with the most modern ideas in grinder construction.

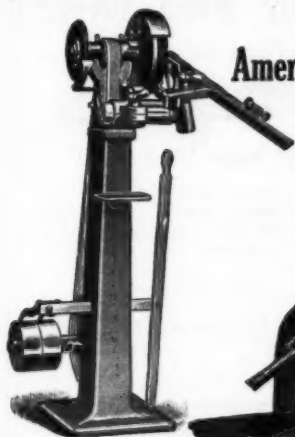
The micrometer adjustment on the horizontal hand-wheel has graduations marked in 1000ths of an inch. These graduations are 5-32 of an inch apart, thus allowing a very fine adjustment of the table for depth of cut. The knee is brought to any required position by means of the vertical hand-wheel which turns a pinion in the rack, and is clamped solidly in place by the hand-nut at the left. The table is carried by a stiff post which moves vertically in the knee and is kept from turning horizontally by a feather.

Better have complete specifications of our Plain and Surface Grinders and Automatic Surface Grinders. See next page for Drill Grinders

La Salle Tool Company

La Salle, Illinois, U. S. A.

La Salle Grinders



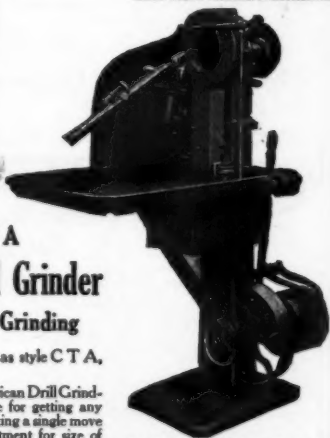
Style C T A

American Drill Grinder

For Dry Grinding Only

Unexcelled as a dry grinder for twist drills from $\frac{1}{8}$ " to $2\frac{1}{4}$ " diameter. Extra large drill holder has capacity from 1" to $3\frac{1}{2}$ ".

Style B T A is a similar machine with overhead countershaft.



Style W T A

American Drill Grinder

For Wet or Dry Grinding

Has the same drill capacity as style C T A, shown above.

A handy feature on all American Drill Grinders is the Caliper Jaw device for getting any desired clearance without making a single move other than for regular adjustment for size of drill. Write for complete specifications, which outline their splendid design in detail.

American Drill Grinders are furnished wet or dry, motor driven, with self-contained countershaft or with overhead countershaft, as fully described in our literature.

La Salle Tool Company

La Salle, Illinois, U. S. A.

There Is Nothing Better Than The
"Duplex" Emery Wheel Dresser
 For Maintaining Fine Cutting Surfaces



Unexcelled for leaving a fine cutting surface on grinding wheels. The patented aluminum hood protects the operator against flying particles. Either of two cutters is furnished: (1) the "Diamond" Cutter, designed for truing large, coarse wheels; or (2) the "Improved" Cutter, for truing medium and fine wheels. These cutters run on a bronze bushing.

Sure we send them on trial—just say the word

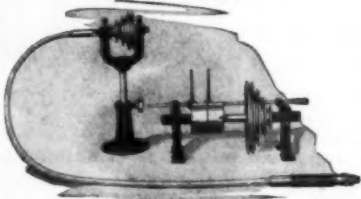
Cleveland Flue Cleaner Mfg. Co.
 321 Frankfort Ave., N. W., Cleveland, Ohio



STRAND

**Flexible Shaft Equipments
 For Belt Drive**

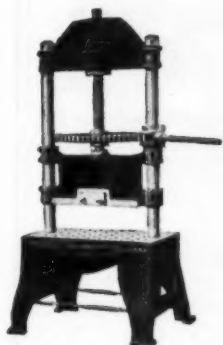
Type C-4-5-6-7



**They
 Get in
 Where
 No
 Other
 Can.**

MADE BY—N. A. Strand & Co.
 Machinery Hall, CHICAGO

This Screw Press Offers Unusual Economy It Just Makes Grinding a Pleasure



Type B Screw Press

The MANHATTAN has a large bed, affording ample room for quick and accurate die making. *It is a one man machine*—no extra help required to operate it. Assures perfect alignment of punch and die—something not always possible with a punch press costing ten times as much.

It also avoids holding up punch presses for this work, and cuts out the extra labor costs required to operate them.

Can shear in any die within its limits.

How's that for maximum efficiency and economy?



Manhattan Surface Grinder

This modern grinder has no vibration because it is built unusually rugged and rigid. It offers ample power for the heaviest work.

New and practical improvements are featured in almost every part of this invaluable machine tool. Affords clearance where it is most needed. Both dials are graduated. The construction of spindle, with over-size phosphor bronze bearings, allows of making very heavy cuts. The table is surface ground with its own wheel.

Operates Silently

Two QUALITY machine tools. Want particulars?

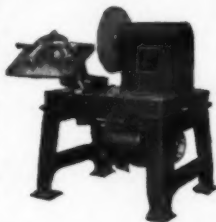
Manhattan Machine & Tool Works
Dept. A., Grand Rapids, Mich.

Fenn PORTABLE Electric Gear Cutter Grinder

Saves Time, Labor, Power—MONEY

Why waste time with a stationary cutter grinder when you can easily carry a FENN No. 1 to any bench or corner in the shop? You simply attach motor to any 110 v. lamp socket and go ahead. *In half a minute* you can change from grinding a 40 pitch cutter to a 3 pitch cutter. Insures keeping your gear cutters always ground radial.

Cuts brass tubing, etc., cleanly and quickly.



Description and price?

The Fenn Manufacturing Company

Hartford, Conn.

Cable Address "Fenn"—Western Union Code

Ott Grinders

Combine the essentials of
ACCURACY and **RIGIDITY**
with **SIMPLICITY** of design

Simplicity accounts for their price, and for
their popularity among good operators.

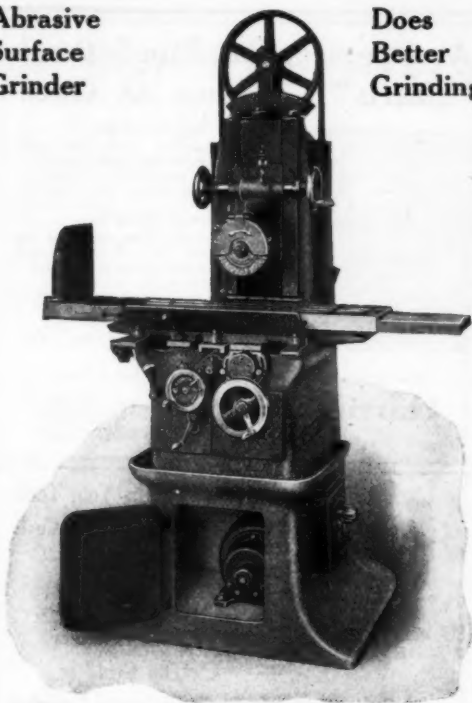
5"x18" Plain—10"x32" Universal—6"x6" Internal

Ott Grinder Company

200 West Tenth St., Indianapolis, Ind.

**Abrasive
Surface
Grinder**

**Does
Better
Grinding**

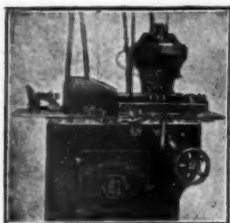


Greater Grinding Efficiency

is yours with the Abrasive Tool Room Surface Grinder. The frame is a heavy, one-piece casting, and as the machine has about twice the weight of an ordinary tool of this kind, the greater rigidity enables you to obtain greater accuracy. Let us mail you the full details of this superb machine.

**ABRASIVE MACHINE TOOL CO., East Providence,
RHODE ISLAND**

An Operator Can Run Several "Harris" Grinders At Once



This HARRIS Precision Automatic Hob and Cutter Grinder is in a class by itself for operating quickly and perfectly. It eliminates the risk of imperfect grinding and spoiled temper through hand grinding.

Being automatic, it does not need constant attention—one operator can run several grinders at once.

Saves your expensive H. S. hobs and form cutters.

Has simple "set up." Ample lubrication.

Our interesting Folder H. K. describes it fully

Harris Engineering Co.

Bridgeport, Connecticut



Keep Up Your Tools Keep Down Your Costs

with

*Grand Rapids
Drill Grinders
Tap Grinders
Universal Grinders*

which

Give Perfect Results

Catalog on Request

Grand Rapids Grinding Machine Co., 17 Ottawa Ave., N. W.
Grand Rapids, Mich.

The "Miller" Wheel Dresser

An Invaluable Cost-Reducing
Grinding Wheel Accessory



Ordinarily much time, labor and power are wasted in the "truing up" of worn or warped grinding wheels. The Miller Radius and Angle Grinding Wheel Dresser cuts out all this expensive and needless loss.

Forms radii from 0" to 1 1/4" concave or convex. Also dresses any angle or form required. "Trues up" wheels up to 12" in diameter. Diamond can be set at right angles through three splines in tool post. Center height adjustment 2". Distance of measuring post to pivot center is 3". By a simple calculation the desired concave or convex can be made quickly and correctly.

For enabling you to make a heavy cut in the high cost of grinding the "Miller" can't be beat. *Why not let it both earn you many good dollars and insure quality production?*

Otto A. Miller & Sons

408 Moffat Bldg., Detroit, Mich., U. S. A.

Brush Finish to Auto Bodies!

A Better Finish in Less Time



Over
20,000
outfits
in use

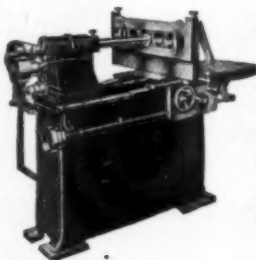
Over
200 in
one plant
alone

STOW FLEXIBLE SHAFT NO. 4, with $\frac{1}{2}$ h. p. motor, driving a 6" wire brush on a sheet aluminum auto body, conditioning it for painting. Also grinds, reams and drills. *Order early!*

STOW FLEXIBLE SHAFT CO., ^{26th &} Callowhill Sts., Philadelphia, Pa.

"Schmidt" Internal Grinder

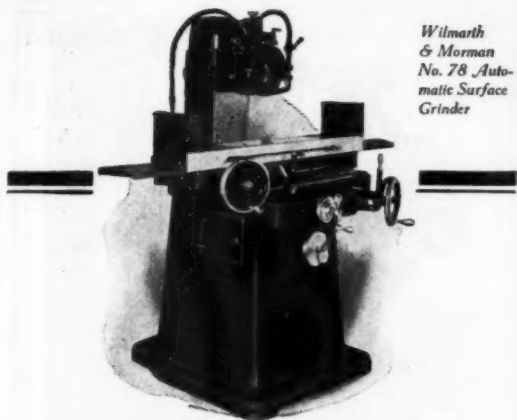
Grinds All Cylinders Perfectly



Invaluable for the fully equipped automobile and tractor repair shop. Will regrind four Ford blocks a day—larger cylinders in proportion. Vanadium steel arbor. Ball-bearing rocker arm counter-shaft and ball-bearing in rear end of emery wheel spindle. The "SCHMIDT" is simple, compact, economical.

Gives top-notch service with rock-bottom economy

B. L. Schmidt Co., Dept. A 8, Davenport, Ia.



*Wilmarth
& Morman
No. 78 Auto-
matic Surface
Grinder*

Speeds Production

Wilmarth & Morman Precision Grinding Machinery is serving indispensably in the world's foremost shops and plants. The No. 78 Automatic Surface Grinder, illustrated above, meets the requirements of plants having need for an extremely accurate machine for gauge and tool work, as well as for die grinding and manufacturing.

Write for our new catalog

Wilmarth & Morman Co.

Master Grinder Makers

1185 Monroe Ave., N. W.,

Grand Rapids, Mich., U. S. A.

Whitney Cylinder Grinder

For grinding all kinds of Gasoline Engine Cylinders as well as work too large or too heavy to revolve.

Machines furnished to grind holes from 3" up to 7" diameter and 14" deep. Also equipped to grind holes as large as 14" diameter and 20" deep.

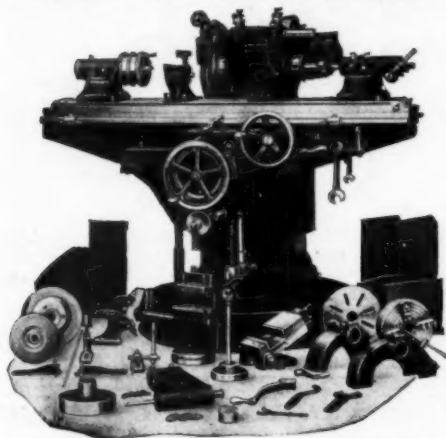
Write for new catalog

BAXTER D. WHITNEY & SON
Incorporated
WINCHENDON, MASS., U. S. A.



Will Do ALL Your Grinding

Better—Quicker—Cheaper



The Thompson 10x36 Universal Grinding Machine

You will find to your profit that it has no equal for doing quickly and accurately plain grinding for straight or taper work between centers, and for surface, edge, die, cutter or internal grinding.

An exclusive feature of the Thompson Grinder is this—the grinding wheel is always maintained in a fixed position, while the table carrying the work is adjustable to any necessary position.

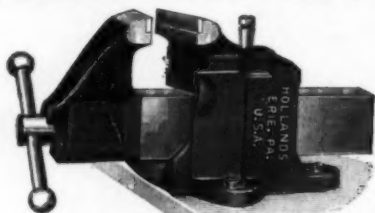
The rigidity, simplicity of adjustment and great ease of control—all delight the practical mechanic, while the superior output never fails to please the man responsible for results. Why not get acquainted?

The Thompson Grinder Co.

Springfield, Ohio

Hollands Vises

Have made good
for 33 years

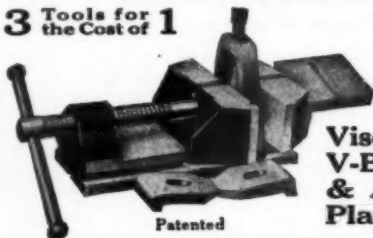


HOLLANDS VISES are made with solid or swivel jaw and stationary or swivel base, and each is a leader in its class. Mechanists' Vises, Filers' Vises, Woodworkers' Vises—what do you need? Write for latest price list.

Hollands Tool Co., (Established in 1887) Erie, Pa.

G-S Combination Vise

3 Tools for
the Cost of 1



Saves
time.
Makes
accurate
work
easy.

Vise
V-Blocks
& Angle
Plate

Takes the
place of
costly jigs

No. 1.....	Dimensions.....	No. 2
5"	Jaws Open.....	7"
2 1/2"	Depth of Jaws.....	3"
8"	Width of Jaws.....	9 1/2"
1 1/2"	Jaws Overhang.....	2"
65 lbs.	Weight.....	105 lbs.

Sent on
30 days'
trial.

Write for
literature

GERMANOW-SIMON MACHINE WORKS

68 MILL ST.
ROCHESTER, N. Y.

The *Greenfield*
No. 1 Plain Grinder

A Low-Cost Machine for the Eco-
nomical Grinding of Small
Cylindrical Parts



A machine
that's right
in line with
present-day
economies,
with its low
first cost,
low operat-
ing cost, and
its **BIG
OUTPUT**

The Small Grinder with the Rapid Cut

THE TABLE FEED is simple and wonderfully efficient, permitting two to three times as rapid cuts as on larger machines. That is one of the main reasons why this small, low-priced grinder is such a big producer. It makes up in speed for what the larger, much more expensive grinders have in depth of cut, and it is better adapted to the work within its capacity.

*Ask for particulars and send sketches or parts
for cost estimate*

Greenfield Machine Company
Greenfield, Mass., U. S. A.

Also Manufacturers of the Greenfield Universal Grinder



DUMORE No. 1 GRINDER

THE Wood Turret Machine Company of Brazil, Indiana, uses the DUMORE High Speed Grinder in many ways which readily show its real merit—in grinding the head of the Wood Turret Lathes for example, and in finishing spindle ends, etc.—the high speed of the DUMORE giving a result much superior to that obtained from slow speed grinders.

Here is a tool in which perfect running balance is combined with correct cutting speed. With a DUMORE in the shop there is no costly tearing down of jobs—no wasteful delay. It is set up easily and quickly wherever it is needed. The DUMORE can solve your grinding problems. It is the only tool on which you may surely rely for speed and accuracy.

Your dealer sells DUMORE Grinders
Ask him for a demonstration.

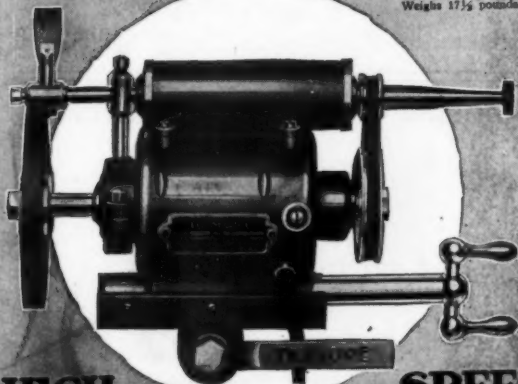
WISCONSIN ELECTRIC COMPANY
4329 Sixteenth Street RACINE, WISCONSIN

DUMORE

Machine Tool Builders Use the **DUMORE**

EQUIPMENT A

For general tool room use
Includes High Speed In-
ternal Spindle A with re-
ar of 3 inches. 30,000 R.P.M.
Comes fully equipped
Weights 17½ pounds.



HIGH SPEED
GRINDERS

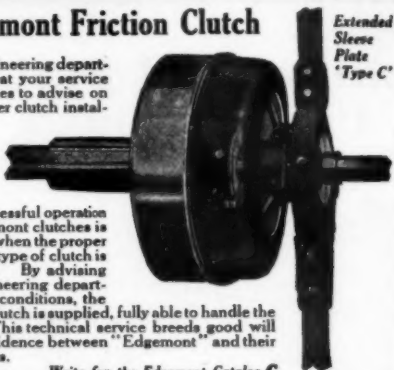
Edgemont Friction Clutch

Our engineering department is at your service at all times to advise on the proper clutch installation.

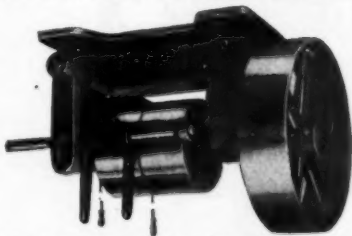
The successful operation of Edgemont clutches is assured when the proper size and type of clutch is selected. By advising our engineering department of conditions, the proper clutch is supplied, fully able to handle the drive. This technical service breeds good will and confidence between "Edgemont" and their customers.

Write for the Edgemont Catalog G

Edgemont Machine Co., Inc., DAYTON, OHIO



Workwell Countershafts



This is a high grade countershaft. The main casting is one piece, babbitted with high speed babbitt. It cannot get out of alignment, which has always been a great trouble in the old style countershafts by binding the bearings and burning them out. This trouble is entirely eliminated in our design.

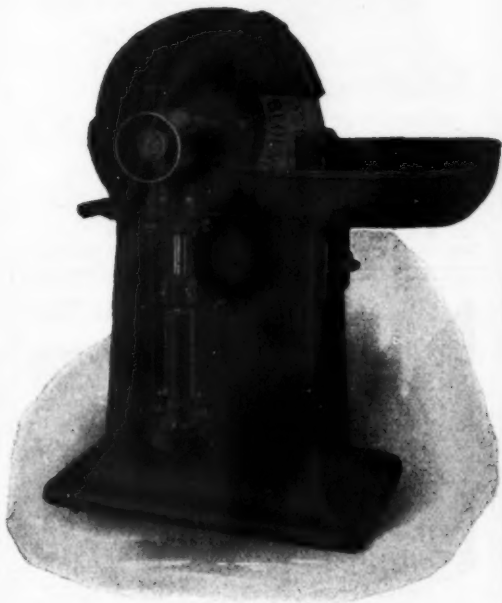
These countershafts are made in three different sizes, Types G1-G2-G3.

Workwell Engineering & Mfg. Co.
Dept. 3. 4145 W. Kinzie St., Chicago, Ill.

GRIND IT

On a BLOUNT

20" Wet Tool Grinder



Catalog on request

Blount Wet Tool Grinders are built in three sizes for 14", 20" and 30" Grinding Wheels respectively.

J. G. BLOUNT CO., Everett 49, Mass.

Van Keuren Gages

A Quality Product, that solves the problem



Set MT MICROGAGES—\$36.00

light waves, and guaranteed accurate within 25 Millionths of an inch. You will be more than satisfied with this set.

Van Keuren Reference Gages are of the highest type and degree of perfection.

OK-VK Microgages,—The high quality, combination gages for use on production work.

They start work right; prevent mistakes, spoilage and rejections.

Arranged in sets for workmen and every shop requirement.

This set gives 5000 combinations in *thousandths*. Gages are finely finished. Standardized by

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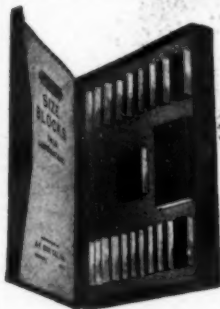
Light Wave Equipments

Modern Measuring Devices

THE VAN KEUREN CO.

362 CAMBRIDGE ST., ALLSTON,

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Mighty Useful Tools



Size Blocks

Invaluable for setting up work accurately on the planer, shaper, miller, etc. Their price is so moderate that you can afford to check them out from the tool crib like other tools. *They save costly master gauges.* The table provided enables you to quickly secure any dimension.

Four sets, including one in the metric scale. Write for Circular

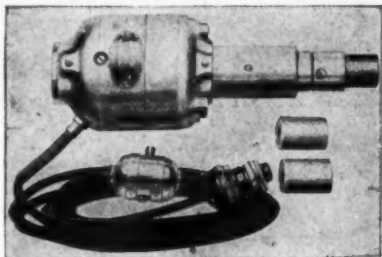
A. F. WAY CO., Inc., Hartford, Conn.

Export Department, 77 Broad St., New York City

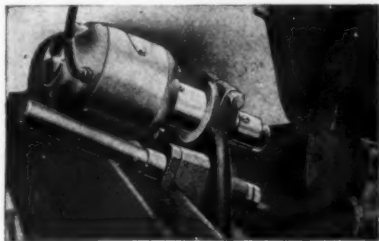
Makers of "LOWAY" Sine Bar and Sine Square

The Precision Truing Machine

A Device for Truing and Dressing Grinding Wheels

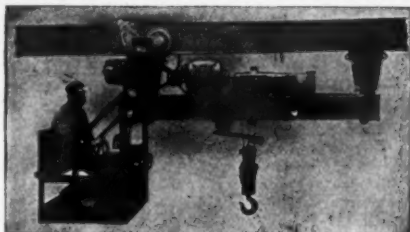


Can be applied to any cylindrical grinder.
Operated off lamp socket, a. c. or d. c. either 110 or 220 v.
Eliminates the use of diamonds.
Reduces truing expense.
Will produce more work and better work.
Gives a freer cutting wheel.
Increases the life of the grinding wheel.



Ask for Circular H7

The Precision Truing Machine & Tool Co.
Cincinnati, Ohio



Euclid Hoists

can be made a big factor in reducing your costs by speeding up material moving and cutting the pay roll.

Write for catalogue today

The Euclid Crane & Hoist Co.
EUCLID, OHIO



NORTHERN

Type D

ELECTRIC HOISTS

will eliminate
wasteful labor.

A. C. or D. C. — ½ to 10 Ton

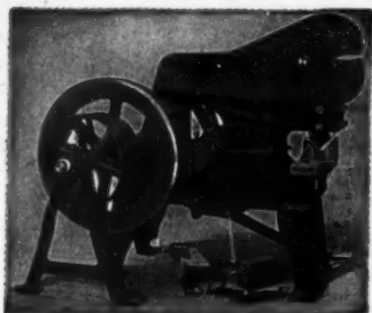
Many other types

NORTHERN ENGINEERING WORKS

208 CHENE ST., DETROIT, MICH.

Makers of "Northern Cranes"

Punches—Shears—Bending Rolls
The Beloit
Combined Power Punch And Shear



Built in six sizes. Nos. 51, 52, 53, 54, 55 and 56

Direct connected motor or belt drive

This is the best all around punch and shear in a combined machine of moderate cost. It is heavy and substantial, and amply back geared to require the minimum amount of power; is strong, compact, and easy to operate. Can be equipped with angle shearing attachment, architectural jaw, or for special work.

We are putting out a complete line of punching and shearing machinery in both power and hand tools, also light and heavy duty bending rolls.

We do not overrate the capacities of our machines.

Write for catalogue and prices

Hendley & Whittemore Co.
100 S. State St., Beloit, Wis.

"QUICKWORK"

Registered in U.S.A. and Foreign Countries

Rotary Shears

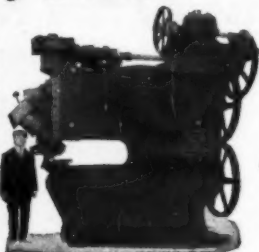
Made in 7 Sizes

Cut all gauges of sheet and plate metal up to 1 inch thick in straight or irregular shapes and openings without cutting in from side of sheet. Leaves square, true edge that requires no finishing. Used in building ships, boilers, tanks, cars & general plate and sheet metal work.

Save 50 to 90%

Eliminates Oxyacetylene cutting and plate planing

Write for catalogue No. 60



Patented June 3, 1913; Aug. 26, 1919.

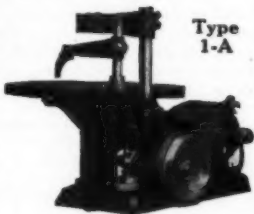
THE QUICKWORK COMPANY, St. Marys, Ohio, U. S. A.

Cable Address "Quickwork," "W. U." and "General" Codes

J & B Filing and Sawing Machine Doubles Output and Cuts Costs

In these days of close figuring, this simple and productive filing and sawing machine saves its costs in a short time. An apprentice turns out more and better work than a first class machinist can by hand filing.

On many jobs it insures a direct saving up to 60%. It can operate where file does not go thru or past work, or where file has to groove out a shoulder.



**Type
1-A**

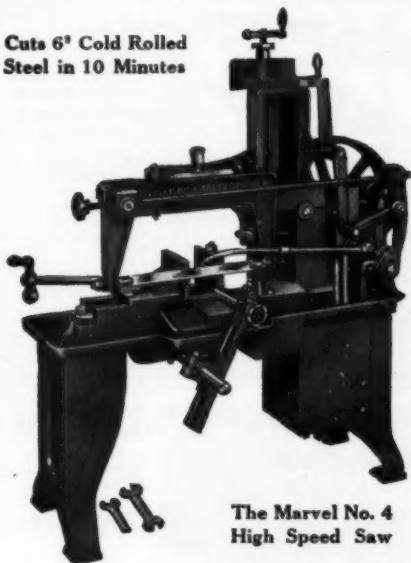
30 DAYS' FREE TRIAL

Return at our expense if not the time saver we claim

JOHNSON & BIDDLE TOOL CO., ELKHART, INDIANA

A Marvel of Speed and Economy

**Cuts 6" Cold Rolled
Steel in 10 Minutes**



**The Marvel No. 4
High Speed Saw**

Consider the speed and other improved features of this machine. The blade is always horizontal. Cuts on the draw stroke, with quick return. Adjustable stroke 4" to 6½". Automatic stop at any desired depth of cut. Takes 3" belt. Also furnished motor driven.

*Marvel Hack Saws and Metal Band Saws for every need,
and each the leader in its class. Write for Catalog.*

Armstrong-Blum Mfg. Co.

341 N. Francisco Ave.,

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Now Is The Time To fix up your shop



If you are not very busy, now is the time to arrange your shop to meet improving conditions. Labor costs must be met with other economies.

"THE HANDIEST RACKS"

For Pipe, Shafting and Bars are a practical necessity in the well-managed shop. They permit the neat piling of this awkward stock in a fourth the space, where it may be kept assorted and counted and easily handled on or off. They save time, space and money, and make a mussy stock neat.

*So good that we
ship them on trial*

Wm. S. Yohe Supply Co.
503 Mahoning Road, N. E., Canton, Ohio



**Save Time
Save Labor
Save Tools**
by

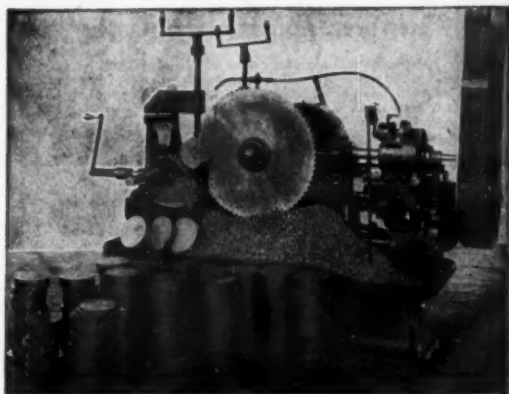
**Supporting your
long stock**

On the "ANYHITE" Adjustable Stock Support, for Hack Saw, Drill Press, Punch Press, Pipe Machine, Milling Machine, Screw Machine, Shaper, Planer, or for Racking Heavy Shafting or Tubing.

We will send you one on 30 days' trial. Price \$15.00 for Standard Height. Special sizes built to order.

The Will-Burt Company
Orrville, Ohio

Cochrane-Bly No. 5 Cold Saw



144 Blanks $5\frac{1}{4}$ " Diameter Cut on This Machine in 8 Hours.

Actual Cutting Time Was 3 Minutes and 10 Seconds Per Cut.

Will Also Cut in Multiple at one Time

76 Bars $\frac{1}{2}$ " Diameter			
26	"	1 "	"
13	"	$1\frac{1}{2}$ "	"
8	"	2 "	"
4	"	$2\frac{1}{2}$ "	"

Five Sizes to Suit All Requirements up to $8\frac{1}{2}$ " Round Bar.

Write for Catalog

Cochrane-Bly Company
Rochester, N. Y.

Slashes Cutting Tool Costs

Peter Bros. Abrasive Metal Cutter

It is invaluable in the tool room for cutting off high speed and hardened tool steel. *It not only effects a clear saving of 75% in time, but prevents waste of steel involved in nicking or breaking.* Easily, quickly and accurately cuts off reamers, taps, forming tools, or brass, copper and aluminum rods. It is a gilt-edged investment.

8" Size \$22.50, with C. S.

Splendid for tool room. Cuts high-speed steel up to $\frac{1}{2}$ " square.

12" Size \$60, with C. S.

Cuts up to $\frac{3}{4}$ " diameter, round or square, at any angle up to 45 degrees. Ball bearing.

15 Days' Free Trial

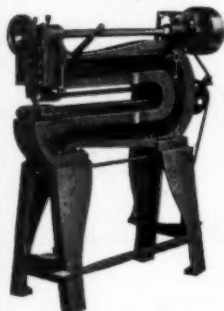
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PETER BROTHERS MFG. CO.

115 Railroad St., Algonquin, Ill.



The Gray Sheet Metal Cutter



"Tell us who uses it and we'll tell you how good it is"

Its users include the best concerns from New England to California, such as American Radiator Co., Victor Talking Machine Co., United Shoe Machinery Co., General Electric Co., American Locomotive Co., Union Hardware Co., Ford Motor Co., etc., etc. Send for long list of prominent users and testimonials.

The four sizes cut $\frac{1}{8}$ ", $\frac{3}{16}$ ", $\frac{1}{4}$ " and $\frac{5}{16}$ " plate, any intricate pattern, easily, quickly and cheaply, leaving edges smooth and metal flat.

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W. J. SAVAGE CO., Knoxville, Tenn.

Alfred Herbert Ltd., Exclusive Foreign Representatives.

"Upstanding Quality"

T. H. L. Front Lever Bench Punch

**Makes Clean Holes and is
Built for Hardest Service**

Price \$60

Extra Punches, 35 cents each,
\$3.75 per dozen. Extra Dies,
40 cents.

Capacity 13/32" hole thru 1/4"
steel, or 11/32" thru 5/16" steel.

Weight 70 lbs.

Adjustable gauge. Punch cannot
lose alignment with die. Made of
best materials. All parts inter-
changeable.



"T. H. L." Quality Punches and Dies

They're accurate, durable
and highly productive.
Quality of steel and per-
fect INDIVIDUAL tem-
pering, backed by 30 years'
experience in punch-mak-
ing explain their superior
merits.

Why don't YOU try them?

T. H. Lewthwaite Machine Co.

417 East 31st St., (Est. 1890) New York City

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Complete Line of
Willard Power Presses

(Inclinable Open Back)



**For Efficient, Economical
 Sheet Metal Press Work**

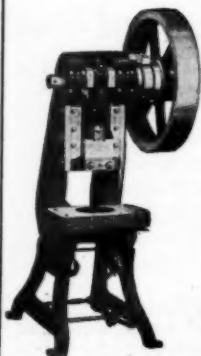
Built for hard service and embodying the latest power press improvements. All parts practically interchangeable. High grade steel shaft capable of withstanding the heaviest strains. Latch has positive safety stop making it impossible for press to "repeat" until the treadle is pulled clear down.

Powerful--Accurate--Durable

Full details on request

The Willard-Middletown Machine Co.
 Cincinnati, Ohio
 Successors to The Willard Press & Tool Co.

Here Is A Press



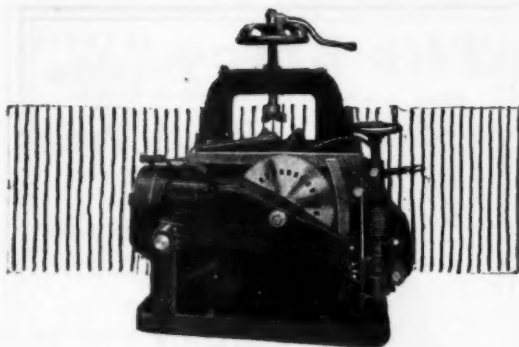
**With Plenty of Steam
 Back of THE PUNCH**

HIGH DUTY
ROCKFORD
 PUNCH PRESSES

Made in straight side and inclinable types. Their great power backed by rigid design enable them to do the work you demand and stand up to it.

Write For Catalog

Rockford Iron Works
 Rockford, Ill.



These Are The Reasons

why a Leasimplex Cold Saw is better equipped to render continuous efficient service:—

- 1—**Insures Rapid Production.** The "Leasimplex" is designed and built for quick preparation for the cut, rapid location of the blade, maximum cutting speed, fast feed and automatic stop with power return of the blade upon completion of the cut.
- 2—**Variable Feed.** The "Leasimplex" Cold Saws are built with quick change gear feed. The feed varies from $\frac{1}{8}$ " to $1\frac{1}{2}$ " and the rate of feed can be changed while the Saw is cutting, without stopping it.
- 3—**Easy to Operate.** The "Leasimplex" is built with centralized control. All operating levers can be reached from one point. One attendant can operate several machines by using the automatic stop. Satisfactory results can be produced with low-priced labor.

There is more to the story of this Saw. Write us for further details.

Made by the **EARLE GEAR AND MACHINE COMPANY, PHILADELPHIA, PA.**

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Administrative Offices, NEW YORK

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Fairbanks Saws, Tools & Machinery, Valves, Engines & Pumps, Drills, Mill, Mine & Railway Equipment, Automobiles, Diesel Engines, Motors, Electric Motors, Machine Tools, Steel Factory Equipment.

The Emco "W"

Bench Power

Punch Press

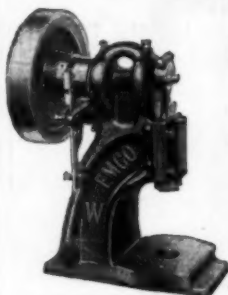
NO'W MADE IN
 $\frac{3}{4}$, $1\frac{1}{4}$ or $1\frac{3}{4}$ " stroke

Record Production:

114,000 operations in
11 hrs. by hand feed

Also Emco "V" Bench

HORN PRESS for ASSEMBLING



It Won't Repeat

Circular on request

The Enterprise Machinery Co., 26 S. Clinton St.
CHICAGO, ILL.

We are well equipped to do your

Enameling, Stamping, Experimental Work and Electric Spot Welding

At Reasonable Prices

Get in touch with us. All of our work is under the care of experts, and it is more than likely that our facilities for economical production will enable us to *do your work cheaper than you can.*

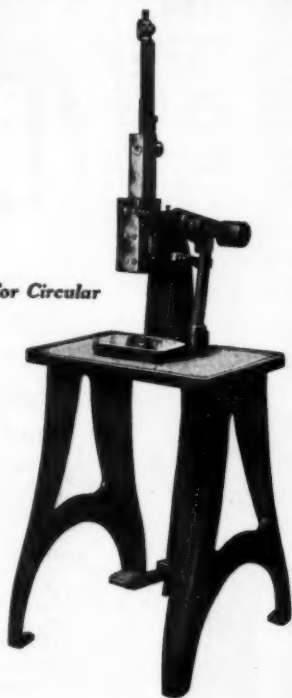
Chicago Ferrule & Nut Co.

Phone, Lincoln 7209.

880 Lill Ave., Chicago, Ill.

Spring Foot Press

Write For Circular



The Taylor & Fenn Company
Hartford, Conn., U. S. A.

Partridge Light Punch Press

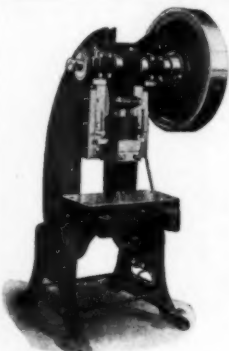
For making novelties from sheet metal, including such operations as stamping, blanking, piercing, bending, forming, perforating, embossing, shearing and wire cutting. Has exceptional strength for its size.

Carefully adjusted to secure accurate working of the dies, and to prevent shearing. Pendulum action of lever gives a stroke of maximum power without tiring operator. Workmanship and material the best.

Write me for the interesting price

E. O. PARTRIDGE, 2041-2049 W. Lake St., CHICAGO

Also Bench, Column & Cabinet Grinders, Polishing Lathes, Light Punch Presses, Hollow Mills, Countershafts, Chuck Arbors and Saw Mandrels



L-J Inclinable Fly Wheel Press

This No. 4 Press has a capacity of 34 tons. It is accurate and rapid. Other sizes; also built in geared head and combination types.

Our Dealers

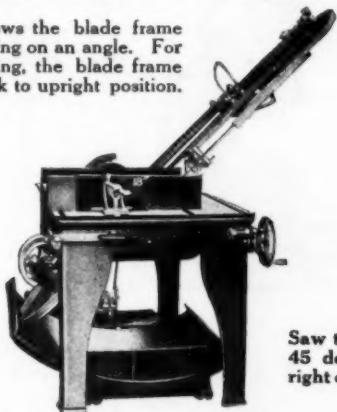
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Write to the nearest, or

Loshbough-Jordan Tool & Mche. Co.
Elkhart, Indiana

Saves Time, Stock and Money
Marvel Metal Band Saw No. 8
A Universal Saw of Great Capacity

The cut shows the blade frame tilted for cutting on an angle. For ordinary cutting, the blade frame is moved back to upright position.



**Saw tilts to
45 degrees
right or left.**

The Marvel No. 8 was designed (1) to do an unusually wide range of metal cutting, and (2) to do that work with the greatest possible economy of time and metal. It saves money by its economies, and it makes money by doing its part in increasing output.

The construction throughout is high grade. Saw Blade Guide Rollers are double ball bearing, with felt dirt-proof rings, and are imbedded in cast-iron cases. Knock-off Dog shifts to stop machine at any depth of cut. Has perfect lubrication at cutting point. Provided with liberal guard protection. Saw speeds of 80, 115 and 200 feet per minute obtained by 3-step cone. Also furnished motor-driven if desired.

May we send Catalog of the "Marvel" Line of Metal Saws?

Armstrong-Blum Mfg. Co.
341 N. Francisco Ave., CHICAGO, ILL.
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Beaudry Hammers

For General Forging

**Saves Fuel, Time and Labor,
Cuts Forging Costs in Two.**

Belt or Motor Driven

Beaudry & Co., Inc.

45 Bromfield St., Boston, Mass.

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Holders-On**

**Keller-Made
Master-Built**

**Keller-Made
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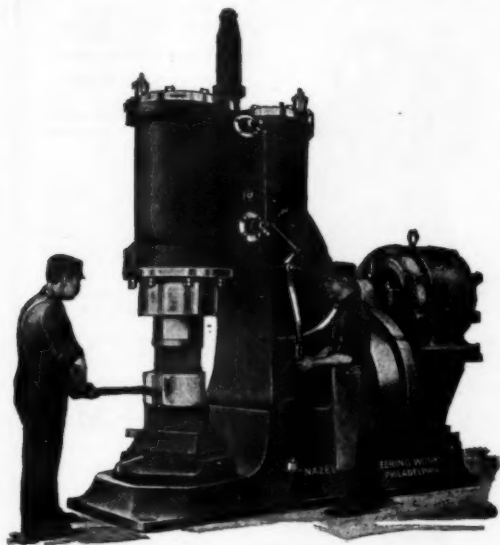
**Sand Rammers
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KELLER
PNEUMATIC TOOL COMPANY
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BRANCHES EVERYWHERE

The Nazel Air Hammer



Noted For Its Blow And Control

A self-contained unit, HAMMER AND COMPRESSOR COMBINED, built in three types, six sizes arranged for BELT OR DIRECT MOTOR DRIVER, with capacities up to 7 inches square, for all manner of jobbing, manufacturing and certain classes of drop forging.

Write for the Nazel Hammer Book; it's yours for the asking.

**Nazel Engineering & Machine Works,
Nicetown, Philadelphia, Pa.**

The Etna Rotary Swager



**Delivers 50 Blows
And Over Per Second**

Invaluable for the more rapid and accurate reduction of round stock. All work is turned out perfectly circular, without waste of material or defacement.

The ETNA method toughens, solidifies and makes metal more resilient. Beats power hammer production by 500% and upwards.

Regular sizes swage $\frac{1}{4}$ " to $4\frac{1}{2}$ " diameter. Special sizes to order within reasonable limits.

*Catalog showing production
records sent on request*

The Etna Manufacturing Co., TOLEDO, OHIO

"You've Got To Show Me"



That's just what
**The Grant Rotary
Rivet Spinner**

will do. Send along one of the toughest samples of your riveting jobs and we'll gladly show you a little of its exceptional efficiency.

Clinches one rivet per second. It not only offers a 500% increase over hand riveting but it operates in *perfect silence*. No more thunderous, nerve-racking clatter. An unskilled operator handles it easily.

Here's a good way to cut riveting costs

The Grant Mfg. & Machine Co.
C. E. Station, Bridgeport, Conn.

G. A. Lewthwaite Superior Tools



The Utmost in Punch Values

The secret of their unusual production capacity lies in the quality of steel used and the perfection of their temper. Why not send us a trial order, that we may add you to our list of satisfied customers?

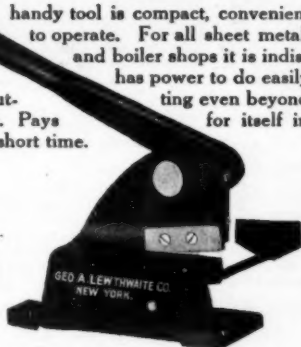
Sheet Iron and Rod Cutter

This and easy blacksmith pensable. It shearing and cut- its rated capacity. Pays a comparatively short time.

handy tool is compact, convenient to operate. For all sheet metal, and boiler shops it is indispensable. It has power to do easily ting even beyond for itself in

Also

Pipe Benders
Bar Benders
Power Presses
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BAR SHEARS, $1\frac{1}{4}$ " capacity and smaller.

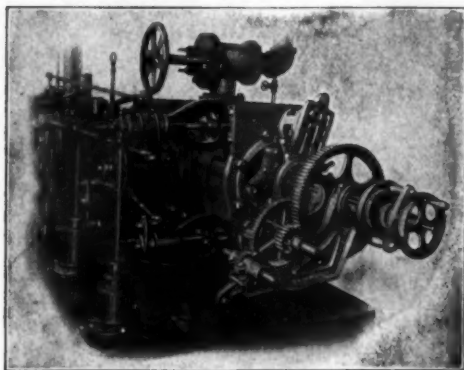
PLATE SHEARS, $\frac{3}{8}$ " capacity and smaller.

Get our Catalog of Iron-Workers' Tools for handy reference

George A. Lewthwaite Co.
116 Walker St., - - New York

Bores In Any Position

Saving Time, Money and Labor



Underwood's Portable Bar Boring Corliss Engine Cylinder

(With only one head off)

JUST THINK of reboring cylinders in less time than it would take to remove them, with all connections and bolts left intact. This economy tool bores all kinds of engines, steam hammers, pumps, air compressors, Corliss valve seats, etc., in place.

The Underwood is readily operated in a space which allows the taking of the piston out of the cylinder. The bar has fixtures for boring in any position, and in cramped places. We can build to order to fit your exact requirements.

Our line of Portable Tools includes:

Millers; circular planer tools; radius planers; rotary planers; machines for truing eccentrics, facing domes, arms for facing cylinder flanges; rotary flue cleaners; pipe benders; locomotive cylinder borers; boring bars for lathe work; crank pin turners; reflex water glass grinders; and special machines built to order.

Our Catalog shows many economy tools—write for a copy

H. B. Underwood Corporation

1015-25 Hamilton St., Philadelphia, Pa.

Second-Hand Machinery

Lists of Second-Hand Machinery, either for sale or wanted, set in uniform style, will be published under this heading at the rate of **50 cents a line**, across the page, each issue, plus **\$2.50** for name and address. Minimum charge, **\$5.00**. No display permitted in this department.

Write directly to those offering the machines for sale for prices and full descriptions. If what you seek is not listed, use the blank enclosed to make known your wants to the publisher, who will pass them along to all Machine Tool List advertisers.

FOR SALE BY

The Strong, Carlisle & Hammond Co., Cleveland, O., Detroit, Mich.

ENGINE LATHES.

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|--|---|
| 13"x 5' South Bend, c. r. | 16"x 8' Lodge & Shipley, t. a. |
| 14"x 6' Von Wyck, c. r. | 17"x 8' LeBlond, 3-st. cone, hvy. duty. |
| 15"x 6' South Bend, c. r. | 18"x 8' Prentice Bros., c. r., g. h. |
| 16"x 8' Lodge & Shipley, compound rest, patent head. | 24"x14' Boye & Emmes, c. r., 3-step cone. |
| 16"x 6' Hamilton. | 24"x22' Union Machine Co., c. r. |
| 16"x 6' Hamilton, c. r. & t. a., std. pat. | |

TURRET LATHES AND SCREW MACHINES.

- | | |
|--|---|
| 1" Millholland, plain head. | 14" Acme screw mche., p. f. to tur. (3). |
| 24"x10" Millholland, g. f. h., p. f. | 26" Gisholt heavy duty turret lathe. |
| 14" Garvin, g. f. h., p. f. | No. 2-A Warner & Swasey g. h. turret lathes, (3). |
| 14" Lodge & Davis, plain head. | No. 3-A Warner & Swasey g. h. turret lathe, (3). |
| 24" Davis turret boring and chucking lathe, with forming rest. | 2"x24" Jones & Lamson g. h. flat turret lathe. |
| 22" Lodge & Shipley heavy duty turret boring lathe. | |

DRILLING MACHINES.

- | | |
|---------------------------------------|---------------------------------------|
| No. 1 Burke, bench, (2). | 21" Superior, sta. hd., b. g. & p. f. |
| 4 spdl. Barr, pl. bearing, sensitive. | 23" Rockford, sta. hd., b. g. & p. f. |
| Single spdl. upright sensitive, (2). | Avey h. s., b. b., bench type. |
| 24" Baker, hvy. duty, sta. head. | 4 spindle Foote-Burt, adj. hd. |

MILLING MACHINES.

- | | |
|---|--|
| Bench miller on column, with c. s. | No. 3 Brown & Sharpe, plain, taper nose. |
| No. 1 U. S. hand, 3 st. cone, c. s., (5). | No. 6 Becker, vert., rotating table. |
| No. 15 Garvin plain, b. g. | 12" Pratt & Whitney, horiz., auto. |
| No. 22 Garvin, vertical spindle. | No. 3 Burke, bench type, hand. |
| No. 14 Kearney & Trecker, univ. | |

GRINDERS.

- | | |
|---|----------------------------------|
| No. 10 Cochrane-Bly auto. bench saw filing machine. | No. 1 Warner & Swasey, cock. |
| 12"x66" No. 4 Landis univ., complete. | Type "DE" Hisey-Wolf internal. |
| No. 1 Brown & Sharpe, univ., (2). | No. 12 B. & S. plain, complete. |
| No. 2 Oakley, univ. (practically new). | Gisholt tool grinder. |
| | No. 14-16 Bealy, wet ring wheel. |

HAMMERS AND RIVETERS.

- | | |
|--------------------------------------|--------------------------------------|
| No. 2 High speed riveting hammer. | 114" thr. Grant rivet spinning mche. |
| Coffman post pwr. dr. hammer 25 lbs. | No. 203 Grant rivet spinning mche. |
| Cady belt drop hammer, 100 lbs. | |

METAL CUTTING TOOLS & SQUARING SHEARS.

- | | |
|---------------------------|------------------------------|
| Excelsior power hack saw. | No. 1 Racine H. S. Hack Saw. |
| 12" Burke metal cold saw. | No. 154 Higley cold saw. |
| Higley cold saw. | |

PUNCH PRESSES.

- No. 11 Badger, hand.

GEAR CUTTERS

- | | |
|--------------------------------------|-----------------------------------|
| 26" No. 3 Brown & Sharpe auto., (2). | No. 13 Brown & Sharpe auto., (2). |
|--------------------------------------|-----------------------------------|

MISCELLANEOUS.

- | | |
|--|-------------------------------------|
| Boring mche., 23" swing, Star horiz. | Polishing lathes, City Machine Co. |
| Broaching mche., No. 2 Lapointe. | Tapper, 1" Burke, bench. |
| Crane and hoist, Canton No. 3. | Tapper, 1" friction vertical bench. |
| Planers 22"x22"x5' Putnam, 1 hd., (3). | Tappers, 1" Rickert-S. horiz., (2). |
| Planer, 22"x22"x5' Gray, 1 hd. | |

SECOND-HAND MACHINERY

FOR SALE BY

Walther Machinery Co., 629 Main St., Cincinnati, Ohio

Drill press, D-3 Colburn heavy duty, used.
 Drill presses, U. S. sensitive, motor driven, d. c., 220 v., (2) used.
 Drill, 8-spindle multiple, No. 4 Morse, used.
 Lathe, 13"x6" Willard d. b. g., s. q. c., c. d., used.
 Millers, Whitney hand type, (3); motor driven, d. c., 220 v., (2) used.

FOR SALE BY

Frank H. Parker Company, First Nat'l Bank Bldg., Chicago, Ill.

Boring mill, 34" Bullard.....		Lathe, 36"x14" New Haven...\$	500.
Lathe, 14"x6" Blaisdell.....\$	100.	Milling machine No. 2 plain..	900.
Lathe, 15"x8" Davis.....	200.	Milling Machine No. 2 univ..	1200.
Lathe, 15"x8" Keed.....	100.	Planer, 56"x60"x26'.....	4000.
Lathe, 18"x10" Fitchburg.....	150.	Planer, 40"x40"x14'.....	2500.
Lathe, 22"x8" Boyd.....	300.	Planer, 14"x14x48'.....	200.
Lathe, 26"x16" Field.....	300.	Press, No. 92½ E Toledo (new)	2700.
Lathe, 30"x12" New Haven ..	350.	Press, No. 52 Toledo.....	350.

Notice: Have just bought complete plant with 44 machine tools; cost new \$10,000, will sell all for \$4000.

FOR SALE BY

H. D. Warner, 57 May St., Hartford, Conn.

Air compressor, Sullivan, cap. 3150 cu. ft., nearly new.		Hammer, 60-lb. Bradley helve	\$800.
Annealing furnace, large, for stampings in large lots.....	\$1200.	Lathes, P. & J. old type turret (3) each.....	300.
Automatics, 1" model B Cleveland, (4) each.....	250.	Millers, Becker large hand, (5) each.....	150.
Automatic, 1½" Cleveland.....	350.	Millers, 12" Pratt & Whitney light auto., receding & quick return table, (12) each.....	400.
Automatics, 3½" Cleveland, (2) each.....	1200.	Millers, No. 2 Pratt & Whitney Lincoln type, (5) each.....	100.
Automatics, 9/16" Acme multiple-spindle, (4) each.....	200.	Millers, No. 12 Pratt & Whitney Lincoln type, (6) each.....	200.
Automatic, No. 55 1½" Acme multiple spindle.....	800.	Molding machines, Tabor, (4). Planer, 30"x30"x8" Pond.	
Automatics, 3½" Gridley, (10) each.....	750.	Planer, 30"x30"x10" Putnam.	
Backing-off niche., Cleveland.		Press, No. 16 Bliss horning.	
Boilers, Manning patent vert., 250 h. p., 160 lb. pressure, (4).		Press, No. 20 Bliss 3" stroke.	
Boring machine, Betts hor.....	850.	Press, No. 20-C Bliss, 3" str.	
Boring & turning mche., 42" Putnam vertical car wheel.		Press, No. 68-N Bliss.	
Boring & turning mchs., 54" Sellers vert. car wheel, (2).		Press, No. 69-N Bliss back grd.	
Chucking machines, No. 24 4-spld. New Britain, (6) each	2600.	Press, Perkins back geared, double action cam, weight about 22,000 lbs., comparative to Bliss No. 6 cam dbl. action.	3500.
Chucking machine, No. 33 New Britain.		Press, No. 73½ Bliss back grd., nearly new.....	1750.
Crane, 10-ton electric traveling.		Punch & shear, Lambertville.	750.
Die sinker, Pratt & Whitney old type No. 2.....	350.	Separator, Dings magnetic.	
Drill press, 3-spld. Taylor & F.	200.	Shaper, Fitchburg 20" trav. hd.	500.
Drills, single-spindle sensitive, new, (2) each.....	80.	Shear, alligator, 24" sq. cold.	
Drill, Detroit 5-spindle hor.	250.	Shear, squaring, 10" Ohl, pwr.	850.
Drill, Baush multiple-spindle	800.	Shear, plate, Ryerson bevel, new	1050.
Fire extinguishers, 40-gallon Badger, on wheels.....	75.	Slitting mche., 16" Torrington.	800.
Grinder, Blanchard vertical.		Tapping machine, Garvin vertical, new.	
Grinders, Bryant chucking, (4) each.....	700.	Timeclocks, International, (10).	
		Trimming & beading machine, No. 166 Bliss.	
		Winch new.....	100.

SECOND-HAND MACHINERY

FOR SALE BY

Russell Machine Co., Inc., 28th St. & A. V. R. R., Pittsburgh, Pa.

LATHES.

48"x32' N. B. P., triple geared.	18"x 8' Sidney, q. c. g., d. b. g.
48"x28' Niles, c. r.	18"x 8' Rahn-Mayer-Carpenter.
48"x26' Pond, triple geared.	15"x 8' Schellenbach, d. b. g., h. s.
36"x18'8" Niles, c. r.	14"x 6' Hendey, q. c. g.
28"x12' Boye & Emmes, q. c. g., d. b. g.	11"x3' South Bend, b. g.
27"x12' Pittsburgh, dbl. b. g.	9"x42" South Bend.
26"x20' 6" Putnam, b. g., c. r.	24"x 6' Gisholt turret, 64" h. s.
26"x16'6" Walcott, q. c. g.	24"x 6' Gisholt tur., 64" h. s., m. d.
24"x16' 6" Johnson lathe.	22"x 8' Bullard turret lathe.
24"x12' Ames, b. g., c. r.	15"x 5' American brass finishers'.
22"x12' Greaves-Klusman, q. c. g.	14"x 5' American speed lathe.
19"x16' LeBlond, motor drive.	13"x 5' Blount speed lathe.

PLANERS AND SHAPERS.

20"x20"x51" planer, 1 hd.	16" American shaper, b. g., m. d.
24"x24"x8 Chandler planer, 1 head.	16" & 20" Gould & Eberhardt, b. g.
48"x48"x22' Pond planer, 4 heads.	22" Ohio sgl. grd. shaper.
72"x56"x12' Betts planer, 2 heads.	24" Cincinnati b. g. shaper, m. d.

DRILLS AND BORING MILLS.

20" Champion, new pl. & bk. gd.	No. 90 Champion post drill.
20" Silver, new, plain and bk. gd.	Garvin 4 spindle drill press.
36" Snyder b. g. drill.	20" Warner-Swasey boring mill.
40" New Haven, b. g. drill.	36" Bridgeport boring mill.
3', 4' & 6' Prentice radial drills.	42" Bullard boring mill, 2 heads.
No. 3 Phoenix air drill.	50" Bullard boring mill, 2 heads.
10" Dwight-Slate sensitive, floor.	60" Niles boring mill, 2 heads.

PUNCHES, SHEARS, PRESSES AND ROLLS.

50" throat Reade sgl. end punch and shear; massive construction.	18" throat Rees s. e. punch.
No. 2 L. & A. twin punch & shear.	Long-Allstatter type A shear, 8"x1 1/2".
No. 4 Doelger & Kirsten alligator shear, cap. 4 1/2" round soft steel.	No. 56 dbl. housing knuckle press.
Morgan plate shear, 96" bet. housings, cap. 1" thick.	Stiles Nos. 3 & 23 inc. presses.
Garrison plate shear, cap. 3"x81", m. d.	Bliss No. 18 o. b. i. power press.
Mesta plate shear, cap. 4"x156",	Straight-side forging press, 6" str.
Knight s. e. punch, 8" thr., 1/2"x1 1/2".	Straight-side punch press, 4" str.
	Bliss No. 70 1/2 s. s., d. g. press, 11" str.
	Garrison 250 ton dbl. crank press.
	Corry Mch. Co. press, 12" stroke.

MILLING MACHINES.

No. 2 Brown & Sharpe universal.	No. 3 LeBlond plain.
No. 2 LeBlond universal.	No. 6 Becker vertical, table 60"x19".

MISCELLANEOUS.

Air compressor, No. 6 Au-To 3"x14".	Grinders, Plymouth Nos. 13, 14, 17.
Air compressor, 8"x8" hor. b. d.	Grinder, Barnes 20" wet tool.
Band saw, Greaves-Klusman 36".	Hammers, 2500 lb. Chambersburg,
Bender, Wallace No. 11 angle, hd. pr.	double leg steam forging.
Blower, Root No. 3 Acme, hand.	Heading, upsetting and forging
Blower, Sturtevant, No. 4, volume.	machine, 3" National.
Blower, Buffalo No. 8 volume	Hoist, contractor's steam, with 8 h.
Blowers, Buffalo Nos. 5 and 6.	p. boiler & 5 h. p. engine.
Boiler, 24"x3' vertical.	Index centers, 12" B. & S. univ.
Bolt cutter, Landis 1 1/2".	Metal lockers, 10 sections.
Boring bar, Underwood portable cyl.	Polishing stand, Diamond No. 2.
Brazing table, all iron, 17"x29 1/2"x31".	Polishing stand, d. end, 42"x1 1/2" arbor.
Chain belt, 16"x8"x1 1/4" p. and gear.	Polishing stand, Cuyahoga dbl. end.
Cold saw, Wagner, size 18 type 3.	Roll lathe, 20" long, suitable for 12",
Cold saw, Gliem, 22" diam. 6" cap.	14" and 16" rolls.
Crane, 10' I-beam, 12'3" span.	Ripsaw table, 49"x30", iron.
Crimping machine for short work.	Slotter, Niles 15".
Forges, Nos. 41-43 Champion new.	Straightening rolls, Cleveland,
Grinder, Greenfield cutter & tool.	84"x10" dia.
Grinder, Diamond No. 3 wet tool.	Trimmer, American No. 2, univ. wood.

SECOND-HAND MACHINERY.

FOR SALE BY

Niagara Sprayer Company,

Middleport, N. Y.

SCREW MACHINE.

One 2 $\frac{1}{2}$ " 4-spindle National Automatic belt driven screw machine, serial number 5022, with number of collets and attachments. Purchased in March, 1920, and used only two weeks. Owing to change in product we have no use for this machine. Price \$3800 f. o. b. Middleport, N. Y.

FOR SALE BY

E. L. Esley Machinery Co., 551-557 Washington Blvd., Chicago, Ill.

DRILL PRESSES.

24" No. 25 Foote-Burt hvy. duty.
22" G. & E. sliding head, (2).

4 sp. Allen high speed b. b. drill.

LATHES.

10"x4' Reed.
14"x6' Sebastian.
18"x8' Whitcomb Blaisdell, q. c. g.
18"x10' Prentice, q. c. g.

20"x14' Putnam.
24"x12' Lodge & Shipley, q. c. g.
30"x14' Niles.
32"x24' Fay & Scott.

MISCELLANEOUS.

Bolt cutter, $\frac{3}{4}$ " Acme, single head.
Boring mill, 34" Colburn vertical.
Broaching machine, No. 2 Lapointe.
Gear cutter, No. 3 B. & S. auto.
Grinder, No. 3 B. & S. plain.
Grinder, 12x48" Cincinnati, cyl.
Grinder, 8 x32" Landis plain.
Grinder, P. & W. vertical surface.
Grinder, 10"x26" Ott universal.
Hammer, 800 lb. W. W., board drop.
Hammer, steam, 800 lb. Massillon.
Miller, No. 33 Kempsmith prod. type
Miller, No. 2 Milwaukee universal.
Planer, 32"x32"x8' New Haven.
Planer, 36"x36"x8' Betts.

Planer, 38"x36"x12' Woodward
Powell.
Planer, 38"x38"x8' Niles.
Punch pr., No. 4 & 4 $\frac{1}{2}$ Niagara, o. b. i.
Saw, Smith & Post cold saw.
Screw machine, No. 0 B. & S. semi-auto, hand.
Screw mach., No. 2 $\frac{1}{2}$ Garvin, hd. mach.
Screw mach., No. 3 Foster, pl. hd.
Screw mach., No. 4 Foster, pl. hd.
Screw mach., 2"x2 $\frac{1}{2}$ " Cleveland auto.
Shaper, 18" Niles, traveling head.
Turret lathe, 2"x24" J. & L.
Turret lathe, No. 2 Pratt & W.
Turret lathe, 24" Conradson.

FOR SALE BY

Frank Toomey, Inc.,

127-131 N. Third St., Philadelphia, Pa.

LATHES.

42" Pond car wheel, motor drive.
36"x16' Sidney, d. b. g., q. c., new.
24"x14' Sidney, d. b. g., q. c., new.
19"x 8' Sidney, d. b. g., q. c., new.

17"x 8' Sidney, d. b. g., q. c., new.
15"x 6' Sidney, d. b. g., q. c., new.
16"x10' Carroll, d. b. g., q. c., new.
13"x 5' 6" Carroll, s. b. g., p. c., new.

SHAPERS AND PLANERS.

14", 16", 20", 24" Steptoe shapers, new.
7" Rhodes, precision, new shaper.
16x16x42" Walter planer, 1 head.

24"x24"x6' Pease 1 head planer.
36"x36"x10' Cincinnati, 3 hds., motor.
60"x60"x16' Pond planer, 3 heads.

MILLERS.

No. 2 Garvin universal, new.
No. 2 Putnam universal, used.
No. 2 $\frac{1}{2}$ Le Blond universal, used.
No. 3 Burke, hand, new.

No. 4 Brown & Sharpe, plain, used.
No. 1 Dow plain, new.
No. 22 Garvin vertical, used.
No. 24 Oesterlein plain, used.

DRILLING MACHINES.

48" Mueller plain, speed box, used.
36" Drees plain, cone drive, used.
32" Superior, s. h., b. g., p. f., new.
28" Superior, s. h., b. g., p. f., new.

21" Superior, b. g., p. f., new.
20" Buffalo and Champion, b. g.
16" Canedy-Otto plain, new.
4-spindle Superior hi-speed, used.

MISCELLANEOUS.

Boring mill, 3" bar Binnse, hor.
Boring mill, 42" Bullard, vertical.
Gear cutter, 40"x6 $\frac{1}{2}$ " Bement, spur.
Grinder, No. 1 Frazer univ., new.
Grinder, 10"x36" Norton plain, used.
Hack saws, 6x6 & 9x9" Peerless, new.

Keyseaters, Nos. 2 & 4 Catlin, used.
Pipe machines, 2", 4", 6" Oster, new.
Pipe machine, 8" Loew, used.
Punch & shear, No. 53 Beloit, new.
Press, hyd., Watson & S., 30 tons.
Shear, No. 46 Beloit, alligator, new.

SECOND-HAND MACHINERY

FOR SALE BY

Brown-McDonald Machinery Co., 2323 N. 9th St., St. Louis, Mo.

LATHES.

13"x 6' Lancaster, c. r., h. s., new.
14"x 6' Monarch, d.b.g.-q.c.g.; used.
16"x 8' Walcott, q.c.g., d.b.g., new.
16"x 8' Bradford, h. s., cpd. r., with
chuck, used.
20"x 8' Lodge & Shipley; used.
20"x 9' Williams turning lathes.

30"x 10' Walcott, q. c. g.; d. b. g.; new.
26"x 8' Walcott plain turning.
26"x 12' Walcott, q.c.g., d.b.g., new.
26"x 12' Wickes, heavy duty, quick
change gear, double bk. gear, with
taper attachment, new.
26"x 12' Draper, triple geared.

TURRET LATHES.

Foster No. 3, plain head, (7).
Wood Tilted Turret, 14" cap., (2).
Omar, 16x6, b. g., p. f. with equip-
ment, (3).
Gisholt, 16" Type A., b. g., (2).

Wysong & Miles, 24" b. g., p. f., air
chuck, (2).
16"x 7' Fulton, b. g., p. f., (4).
14"x 4' 6" S. & K. plain head.

DRILLING MACHINES.

No. 1 Burke, bench, chucks, new.
3" Leland Gifford, high speed.
3 spindle Fox style A, 4" cap.
4 spindle Garvin; used.
4 spindle Allen, high speed cap. 29/32.
5 spindle Allen, high speed cap. 29/32.

6 spindle Allen, high speed cap. 29/32.
13" Prentice, p. f., stat. table, used.
20" Champion, s. b., b. g. & p. f., new.
20" Champion, s. b., w. & l., new.
Prentice suspension drill; used.
30" Gould & E., sl. hd., b. g., p. f.

PLANERS.

26"x 36"x 15' Patch, o. s., 1 hd. on cross rail, 1 head on side, used.

MILLING MACHINES.

No. 2 American Lincoln, b. g., new.
No. 1 U. S. hand, vise and arbor.
No. 2 P. & W., Lincoln type, used.
No. 1 B Fox hor., h. & p. f., new.
24" Osterlein, universal.
Hecker No. 7H Lincoln; used.
Hendey No. 4 Lincoln type, q. c. g.
Foster thread miller.

No. 3 Garvin, hand, used.
No. 3 B Owen pl. hor., with vertical
attachment & dividing head, used.
Hendey, Lincoln type, b. g. with q.
c. g. to feed, tables 11x30, (6).
No. 6 Whitney, hand; used.
No. 3 1/2 Fox, hand & power fd., used.

PRESSES.

Nos. 1, 2, 3, 4 Loshbough-Jordan, o.
b. l., new.
No. 2 Sidney, o. b. l. used.
No. 1 Greenerd, arbor, used, (9).

No. 2 Greenerd, arbor, used, (6).
Nos. 2 & 3 Geier, arbor; new.
Perfection, 30 ton, arbor; new.

SAWS.

Nos. 1 & 2 Marvel, draw cut, new.
No. 1 Racine, 6x6 high speed, new.

Racine hi- speed, 3 sp., 8x8" used.
Williamson, metal, used.

GRINDERS.

Nos. 1, 2 & 3 Western, d. e., new.
Nos. 1, 2 & 3 St. Louis, d. e., new.
No. 30 Safety E. W. Co., elec. (4).
No. 1 Grand Rapids universal cutter
and tool; new.
Wood No. 2 univ. cutter & tool; used.

G. R. B-2-T drill grinder.
U. S., electric, 110 v., d. c., bench.
Essley, cylindrical.
No. 1 American, surface; new.
No. 2 American, surface, new.
14" Besly wet ring grinder.

HAMMERS.

30 lb. Rochester helve, used.
Foot hammer, Standish.
900 lb. Lane, dbl. fr., st. forging, used.

No. 50 Star trip hammer, new.
1200 lb. Chambersburg double frame,
steam forging, used.

MISCELLANEOUS.

Bolt threader, Greenfield 1/2" to 1 1/2".
Bolt threader, Greenfield 1/2" to 3".
Compressor, 13x8x12 Curtis; used.
Lathe chucks, all sizes to 16" diam.
Motors, 5 & 7 1/2 h. p. G. E., 220 v., new.
Motor, 10 h. p. G. E., 3 ph., 60 cy.,
220 v., 1800 r. p. m., new.
Pipe cutter, B. & K., 4" cap.
Pipe mch., No. 76 Forbes, 3", used.

Pipe machine, 3" Borden, hand.
Riveters, Grant and Shuster; used.
Shaper, 16" Whipp, sgl. gr.; new.
Shaper, 16" Gould & Eberhardt; used.
Spot-welder, Federal electric, ca-
pacity 1/2"; used.
Stake punch & riveter, No. 3 Hilles
& Jones, 3" thr., wt. 16000 lbs., used.

SECOND-HAND MACHINERY

FOR SALE BY

Tranter Manufacturing Co.,

Boring mill, No. 2 Cleveland horiz.
Drill, 20" Barnes, with equipment.
Drill, 24" Hamilton, with equip.
Drill presses, Avey, (2).
Grinder, No. 3 B. & S. univ., with equipment.
Grinder, Blount wet emery, & c. s.
Grinder, Hamilton wet tool.
Grinder, New Yankee drill.
Grinder, cutter, small.
Hack saw, No. 4 Robertson, with equipment.

105 Water St., Pittsburgh, Pa.

Lathe, 16" Cincinnati, with equip.
Lathe, 16" Hendey, with equip.
Lathe, 18" Bradford, with equip.
Lathe, engine, 18"x8".
Lathe, speed, Wells, with equip.
Miller, No. 2 B. & S., with equip.
Miller, No. 3 B. & S. pl., with equip.
Miller, No. 3 B. & S. vertical with equipment.
Planer, 3'x8' Gray, with equipment.
Radial drill, 4' Fostick, with equip.
Shaper, 16" Smith & Mills crank.

FOR SALE BY

B. C. Allen Machinery Co.,

Arbor press, 30 tons.....\$ 100.
Bolt cutter, 3" National..... 275.
Brakes, 8-16", power.
Brakes, 6" hand..... 125.
Drill press, new 20", b. g., p. f. 165.
Drill press, 20"..... 65.
Drill press, 34" Barnes, sld. hd. 450.
Drill press, 2, 3 & 4 spindle...\$75 up
Grinder, Norton No. 1 univ....\$ 300.
Keyseater, Baker Bros..... 175.
Miller, No. 34 Fox..... 250.
Miller, No. 6 Steptoe..... 250.
Miller, No. 25 Becker, b. g..... 475.
Miller, No. 3 Owen universal. 1325.
Miller, No. 3 Becker vertical... 850.
Planer, 24x24x5' Gray..... 650.
Punch press, No. 54 Walsh grd. 1250.

104 S. Clinton St., Chicago

Punch press, No. 4 L.-J. grd. \$1050.
Punch press, No. 19 Bliss..... 300.
Punch press, No. 40 Perkins... 300.
Punch press, No. 4 solid back. 550.
Punch press, foot..... 45.
Shaper, 15" Smith & Mills..... 475.
Shaper, 14" Juengst, crank..... 250.
Shaper, 16" Queen City, b. g..... 650.
Shaper, 20" American, b. g..... 800.
Square shear, 48" Bliss, power, 10 gauge..... 550.
Square shear, Niagara, power 12 gauge..... 450.
Square shear, 6' foot power..... 225.
Square shear, 36" foot..... 150.
Square shear, 30" foot..... 65.
Several car loads of bargains.

FOR SALE BY

The O'Brien Machinery Co.,

Bending rolls, 8', 8" and 6" diam.
Bolt cutter, 4" Acme, single head.
Bolt cutter, 1" Acme.
Bolt cutter, 3" Acme single head.
Boring mill, 32" Rogers, turret hd.
Boring mill, 52" Bement vertical, with 2 heads, motor driven.
Drill, 34" spindle Baker Bros. heavy duty upright.
Drill, Allen 5-spindle, high speed.
Drill, Allen 6-spindle, high speed.
Drills, Moline heavy duty hog drills (2).
Hammer, 800 lbs. Bement-Miles, double frame steam.
Hammer, 1200 lbs. Bement-Miles, double frame steam.
Hammer, 2,000 lb. United Engine Co. board drop.
Lathe, 8"x108" Fitchburg Lo-Swing.
Lathe, 16"x7" Pratt & Whitney.
Lathe, 18"x9" Lehman.
Lathe, 20"x9" Lehman.
Lathe, 20"x14" Powell.
Lathe, 24"x10" Gang.
Lathe, 36"x23" Hughes & Phillips.

119 N. Third St., Philadelphia, Pa.

Lathe, 48"x16" Sellers.
Lathe, 85"x18" Bement.
Miller, No. 3 Hendey plain
Miller, No. 34 Fox.
Miller, No. 2-A Brown & Sharpe universal, geared head, vertical attachment and rotary attachment.
Miller, No. 3 Becker vertical.
Pipe machine, 4" Oster.
Pipe machine, 2" Cox, heavy duty.
Pipe machine, 2" Oster.
Pipe machine, 6" Oster.
Planer, 6"x50"x18" Betts.
Presses, several Waterbury Farrell double acting, weight 2,000 lbs.
Presses, Toledo No. 53 straight sided power, 34" stroke, (7).
Press, No. 4 Toledo.
Press, No. 34 Toledo.
Shaper, 16" Hollingworth, back grd.
Shaper, 18" Hollingworth.
Shapers, 2-12" & 2-15" Springf'd.
Shapers, 12", 20" and 24" Juengst.
Slotter, 12" stroke Bement.
Turret lathes, No. 3 Warner & Swasey, geared friction head, (4).

SECOND-HAND MACHINERY

FOR SALE BY

Niles-Bement-Pond Company, 111 Broadway, New York
 Located at our various factories and stores.

LATHES.

18"x 8' LeBlond, quick change.	32"x12' Pond, c. r.
22"x 8' Niles, c. r.	36"x20' Pond, 220 v., d. c. motor dr.
24"x10' Whitcomb, q. c.	42"x20' Niles, c. r.
26"x10' Pond, q. c., 220 v., d. c. motor.	48"x30' Niles, c. r.
26"x20' Niles, c. r.	50"x17' F. B. Miles.
28"x12' Pond, c. r.	54"x28' American, t. g., 220 v., d. c. mtr.
28"x18' Niles, c. r.	50" Niles pulley lathe.

TURRET LATHES.

No. 6A P. & J. auto., 220 v., mtr. d. c.	28" size J. Gisholt, 3 1/2" spindle.
1"x10' P. & W., turret lathe.	24" size I Gisholt, 220 v., mo. dr., d. c.
2"x24' Jones & Lamson, cone head.	28" Milwaukee rigid, 4 1/2" spindle.
2"x26' Pratt & Whitney turret lathe.	32" Conradson turret.
2 1/2"x26' Pratt & Whitney, turn table.	34" size K Gisholt.

PLANERS.

30"x30"x 6' Pond, 2 heads.	38"x38"x16' Niles, 3 heads.
30"x30"x12' Pond, 2 heads, 220 v., d. c., reversing motor drive.	42"x42"x14' Pond, 3 heads.
30"x30"x10' Pond, 2 heads.	60"x60"x14' Niles, 4 heads.
36"x36"x12' Gray, 2 heads.	60"x60"x20' Niles, 3 heads.
38"x38"x10' Niles, 2 heads.	60"x60"x24' Niles, 4 heads.
38"x38"x12' Niles, 4 heads.	72"x72"x12' Bement, 4 heads.
36"x36"x16' Pond heavy, 2 heads, 220 v., d. c., reversing motor drive.	72"x72"x20' Ridgway, 4 heads, 220 v., reversing, motor d. c.
	10'x10'x36' Betts, 4 hds., 220 v., d. c. mtr.

MILLERS AND GEAR CUTTERS.

No. 5 B. & S. plain cone type.	No. 6 60"x12" B. & S. gear cutter.
No. 5 B. & S. vertical, cone type.	15" Gleason bevel gear generator.
No. 3 36"x8" B. & S. gear cutter.	6"x48" P. & W. thread miller o. s.
No. 4 36"x9" B. & S. gear cutter.	6"x80" P. & W. thread miller o. s.

DRILLING MACHINES.

40" Aurora, tap, attach.	5' Ridgway, 220 v., d. c. motor.
3' Grant radial drill and boring mch.	6' Niles full univ., 220 v., d. c., m. d.
3' Dreses plain radial.	6' Niles semi-universal, old style.
4' Bickford plain radial.	6' Pond radial, 220 v., d. c. motor.
4' Niles full universal, old style, 220 v., motor d. c.	No. 13 P. & W. multiple 13 spindles.

GRINDERS.

2 1/2" Drill grinder.	8"x30" Fraser universal.
No. 8 Higley saw grinder.	10"x12" Norton plain.

BORING MACHINES.

No. 1 Bement horiz., 2 1/2" spdl., 5' tbl.	No. 4 Bement horiz., 4 1/2" spdl., 10' tbl.
No. 2 Bement horiz., 3 1/2" spdl., 6' tbl.	60" Bement bor. & t. mill.
No. 2 1/2' Niles horiz., 4" spdl., 6' tbl.	10' Niles b. & t. mill, 220 v., d. c. mtr.
No. 3 Bement horiz., 4" spdl., 9' tbl.	5" spindle Niles floor borer.
No. 3 Bement horiz., 4 1/2" spdl., 9' tbl.	6" spdl. Bement floor boring & drill.

MISCELLANEOUS.

Air compressor, type 10, Ingersoll-Rand, steam driven, capacity 535'.	Engine, gen. set, d. c., 220 v., 100 k.w.
Air compressor, Ingersoll-R. duplex, mtr. dr. 33 h. p. d. c. mtr., cap. 215'.	Graduating machine, LeBlond.
Air compressor, Gardner class D, duplex, steam, capacity 537'.	Hammer, 750 lbs., sgl. frame, Sellers.
Blower, No. 10 Sturtevant.	Hot blast apparatus, Sturtevant, 120" housed steam fan engine dr., 10 section corrugated base heater 8' 6"x6' 6"x6' high, 440' per section.
Blower, No. 70 Buffalo.	Keyseater, No. 1 Baker.
Crane, 3 ton, Niles, 14' 2" span.	Motor, 100 h. p. West., mill type, 220 v., 2 p., 60 c., a. c.
Crane, 20 ton, 48' span Sellers, 220 volt, motor direct current.	Profiler, No. 3 Keller, automatic.
Engine, 125 h. p., Phila. cross comp.	Saw, 8" rounds, Higley.
Corliss air compressor.	Screw shaver, No. 2 P. & W.
Engine, 150 h. p. Phila. Corliss.	Separator, American No. 1, oil.
Engine, 200 h. p. Corliss, twin.	Slotter, 6" Bement.

SECOND-HAND MACHINERY

FOR SALE BY

E. B. Stickley Mch. Co. 693-701 E. Congress St., Detroit, Mich.

Gear generator, Bilgram, 16".
Gear generator, Gleason, 18".
Gear hobbars, No. 2 Schuchardt & Schutte, cap. 36" dia. (3).
Gear machines, Fellows, 36", for spurs, (3).
Gear machine, No. 2-B Newark, 24", for spurs and bevels.
Grinder, No. 4 Gardner double end, ring wheel.
Grinder, No. 2 Landis internal.

Milling mche, No. 3 Cincinnati vert.
Milling machine, Ingersoll, slab type, 42x42x12" motor drive.
Squaring sh., No. 500 3/16-E Toledo, blades 97" long, 3/16" cap., 15" gap.
Turret lathe, Steidle 24" single pulley drive.
Turret lathes, No. 24 G. G. Prentice, 4-spindle semi-automatics (2).
Turret lathes, single and double spindle, Jones & Lamson, (4).

FOR SALE BY

Tubor, Velick & Co.,

629-631 W. Lake St., Chicago, Ill.

Drill, 24" Ryerson, p. f., b. g.
Drill, 25" Barnes, p. f., b. g.
Drills, 2-3-4-5-6 spindle Allen, h. s., b. b., (9).
Drill, 13-sp. mult. P. & W. h. s., 24" capacity.
Grinder, 36x10 Saxon, surface.
Lathes, 14" to 24" swing, beds up to 18", q. c. and plain, all makes.
Lathes, 31x60 Fitchburg Lo-Swing, (10).
Millers, Wisconsin, hand, (25).
Millers, U. S., hand, (15).
We also have on hand steel foundry trucks, paper balers, motors, tinners' rolls, shafting, belting, hangers; grinders, bench, floor and tool post; pulleys, electric drills.

Miller, Van Norman heavy duty hand.
Millers, Fox No. 31, p. f., (50).
Miller, Kempsmith No. 1 pl. p. f. b. g.
Millers, Becker No. 25, p. f., b. g., new, (3).
Miller, Becker 7H, Lincoln type
Punch presses, No. 601 rack and pinion, (4).
Screw mche, Warner & S. No. 4.
Screw machines, Smurr & Kamen No. 4, (10).
Screw machine, Garvin No. 1, hand.

paper balers, motors, tinners' rolls, shafting, belting, hangers; grinders, bench, floor and tool post; pulleys, electric drills.

FOR SALE BY

McCoy-Brandt Machinery Company

Office and Warehouse, 210-218 Penn Ave., Pittsburgh, Pa.

BENDING ROLLS.

16' Wickes, cap. 1" plate, m. d.
12' H. & J., cap. 1/2" plate.
8' Niles, cap. 3/8" plate.

10' Bertsch, cap. 14 ga.
5', cap. 3/16" plate.

GEARED HEAD HENDEY LATHES.

New 14"x6' arr. for m. d., with draw-in attach., one with relieving attach., (4).
Slightly used 14"x6' arranged for m. d., excellent condition, (7).
All the above have pans and lubricating equipment, also silent chains.

MILLING MACHINES.

No. O B. & S., plain.
No. 11 American plain, new.
No. 2 Kempsmith plain.

No. 3 Cincinnati plain.
No. 3 Brown & Sharpe universal, index head.

BROWN & SHARPE AUTOMATICS.

No. 2-G, with motor 220 v., d. c.
No. 2-G, belt drive.
No. 2, belted (7).

No. 2, belted, with chasing attachment, (5).
No. OG, with motor 220 v., d. c.

MISCELLANEOUS.

Boring mill, 42" Putnam, 2 heads.
Hammers, steam drop, 1000 & 1500 lb.
Lathe, 12"x6' Hendey, cone.
Lathe, 18"x8' American, q. c. g.
Lathe, 20"x7' American, q. c. g.
Lathe, 24"x26' American, geared hd., m. d., motor 220 v., d. c.

Lathe, 26"x12' Putnam, q. c. g.
Planer, 42"x42"x8' Gray, 4 heads.
Planer, 30"x30"x10' Sellers, 1 head.
Shaper, 32" Cincinnati, b. g. crank.
Shears, alligator, cap. 1", 1 1/2", 2", & 3".
Shears, guillotine, cap. 1" and 2".

Large stock of both new and used Punches, Shears, Hammers, etc.
Immediate shipments—Partial List.

SECOND-HAND MACHINERY

FOR SALE BY

Federal Machinery Sales Company,

8 N. Jefferson St., Chicago, Ill. 218 Sycamore St., Milwaukee, Wis.

Used Tools—Excellent Bargains

Boring and turning mill, 100" Niles-Bement-Pond vertical.
Cold saw, No. 11 $\frac{1}{2}$ Higley 3".
Drills, new No. 12 Natco multi. spindle, each having ten spindles, (2).
Gauge grinder, Springfield universal, with motor.
Gear generator, 14" Lees-Bradner.
Grinder, 12"x24" Modern plain.
Saw, No. 10 Racine.
Tapping machine, No. 1 Garvin vertical automatic.

FOR SALE BY

Herman L. Winterer,

943-53 N. Front St., Philadelphia, Pa.

LATHES.

43"x17 $\frac{1}{2}$ " Bement-Miles.
42"x25' 6" Putnam.
42"x16' Niles.
37 $\frac{1}{2}$ "x14' Johnson d. b. g., q. c. f.
32"x12' Pittsburgh, heavy duty, q. c. g.
26"x16' 6" American, q. c. g.
27"x12' Bullard.
26"x11' Wickes, q. c. g.
28"x10' Niles, q. c. g.
24"x28' Johnson.
25"x14' Hendey, q. c. g., taper attachment, oil pan, (2).
21 $\frac{1}{2}$ "x8' LeBlond (2).
20"x8' 6" Walcott, d. b. g., q. c. g., (2).
20"x 8' Whitcomb Blaisdell, q. c. g.
19"x12' Flather.
19"x10' Draper, patent head.
18" x 7' Chard, d. b. g., semi q. c. g.
18"x6' to 8' lathes. (6).
17"x10' Lodge & Shipley, q. c. g.
16" Lathes, (10).
14" Lathes, (19).
And many others.

TURRET LATHES.

43"x 6' Lodge & Shipley chucking.
28" Pond, triangle.
3x36" Pratt & Whitney hollow hex.
19"x7' Fay & Scott.
No. 22 $\frac{1}{2}$ Garvin Monitor.
No. 3 Bardons & Oliver, back grd.
No. 5 Bardons & Oliver.
14"x4' Warner & Swasey.

DRILL PRESSES.

6' Drees univ. radial.
42" Economy radial.
40" Barnes horizontal radials, (2).
36" Bickford radial, circular base, motor driven.
18" 4-spindle 2-housing, Foote-Burt.
14" 6-spindle Allen sensitive.
14" 4-spindle Allen sensitive.
40" Lodge & Davis, b. g., sliding hd.
20" Barnes, geared head.
20" Hoosier, new, (3).
20" Champion, new, (6).
12" Allen, bench.
Plain drills, all sizes.
Drill presses, assorted sizes.

MILLING MACHINES.

38"x6' Ingersoll horizontal slab.
No. 5 Cincinnati, table 94"x50 $\frac{1}{2}$ ".
No. 15 Garvin, table 12x42".
No. 3 Becker Bramard, table 12x40".
No. 3 Cincinnati, table 12x47".
Whitney hand miller.
No. 27 Industrial Works, Lincoln type, table, 7x27".
Gooley & Edlund, 7 $\frac{1}{2}$ x46" table.

PLANERS AND SHAPERS.

48"x48"x16" Pond planer, 3 heads.
26 $\frac{1}{2}$ "x28"x 8' Hendey planer.
26"x28"x 8' American planer.
48" Morton draw-cut shaper.
21" American, back gear shaper.
16" Gould & Eberhardt shaper.
39" Pedrick & Ayer, open side.
14" Warren shaper.

MISCELLANEOUS.

Bolt machine, 1" National.
Boring mill, 100" Sellers, vert. dbl. hd.
Boring mill, car wheel, 60" Newton.
Boring, drilling and milling machine, 17 $\frac{1}{2}$ Bement Niles horizontal.
Grinder, 13 $\frac{1}{2}$ "x5' Landis universal.
Grinder, disc, No. 17 Besly.
Grinder, disc, No. 1 Besly.
Hammers, 60 lb. Bellefonte upright, (2).
Keyseater, 24" stroke, Baker Bros.
Keyseaters, 18" stroke Morton, (2).
Keyseater, Mitts & Merrill No. 2.
Punch presses, all sizes, (105).
Punch & shear, Industrial Wks. d. e., capacity 1" in 1", squaring 4"x6".
Slotter, 30" Niles.
Squaring shear, 54" Niagara grd.
Tooth rounding machine, Schuchardt & Schutte.

Large assortment of General Machinery. Send for Complete List.

SECOND-HAND MACHINERY

FOR SALE BY

J. Bleser Manufacturing Co.,

Adding mche., 9-column Burroughs, practically new, \$250.
Air compressors, 10x10 Sullivan, practically new.
Air tank, 200 gallon.
Chain hoists, Wright 2-ton h. s., new.
Cranes, Whiting overhead, hand pwr.
Crucibles, Nos. 60 and 70, new.
Crucible furnaces, Fisher, fuel oil.
Drill presses, 20" Royersford, b. g.
Lathe, 17" LeBlond, rapid pwr., q. c.
Lathe, 21" LeBlond, rapid pwr., q. c.
Lathe, 20"x5' Monarch, q. c.

Springfield, Ill

Motors, 20-30-40 h. p. Bullock Gen. Elec., practically new.
Oil storage tank, 8,000 gallon.
Snap flasks, Arcade 10x16x4Cx3D.
Snap flasks, 12x16 Taper.
Sprue cutters, Champion, Riddle and Tessmer.
Squeezers, Tabor pwr. molding mch.
Stenciling mch., Ideal style 2, practically new; cost \$105.; price, \$75.
Time recorder, Cincinnati, complete with racks, etc., \$175.
Transformer for elec. brass furnace.

FOR SALE BY

Brownell Machinery Co.,

Boring mill, No. 1 Lucas horiz.
Boring mill, No. 32 Lucas horizontal, direct motor drive.
Boring mill, No. 1 Cleveland hor.
Drill, 26" H. & W. sens. radial.
Drill, 3" American Tool Wks. radial.
Drills, 25" Cincinnati upright.
Drills, 25" Hoefler, sliding head.
Gear cutter, No. 24 Whiton auto.
Gear cutter, Whiton, hand feed.
Gear generator, 11" Gleason, bevel.
Gear shaper, No. 612 Fellows.
Grinder, 6x30 Morse plain.
Grinder, 10x50 Norton plain.
Grinder, No. 1 Bryant chucking.
Lathes, 14"x 6" Flather, q. c. g.
Lathes, 16"x 5" Flather, q. c. g.

11-13 Eddy St., Providence, R. I.

Lathes, 20"x 8' Whitcomb-Blaisdell.
Lathes, 20"x10' Roulsted.
Miller, No. 1 Garvin universal.
Miller, No. 1-B Kearney & Trecker.
Miller, No. 2 Brown & Sharpe pl.
Miller, No. 2 Van Norman duplex.
Planer, 17"x20"x5' Whitcomb-B.
Planer, 22"x22"x5' Whitcomb-B.
Planer, 24"x24"x6' Whitcomb-B.
Planer, 30"x30"x8' Whitcomb-B.
Rack cutter, Gould & E. automatic.
Shaper, 14" Flather plain.
Shaper, 15" Kelly plain.
Shaper, 18" Flather plain.
Swaging machines, No. 2 Standard Machinery.
Swaging machines, No. 4 B.

FOR SALE BY

A. M. Stoehr Machinery Co.,

Bench lathes, Hardinge and Elgin.
Bolt cutters, 1/2" & 1" capacity.
Compressors, steam & belt drive.
Drill press, 12" L. & G. 2 spindle.
Drill press, 3-spindle Avey h. s.
Drill presses, 4, 5 and 6-spd. Allen high speed.
Drill press, 20" Champion, b.g., p.f.
Drill press, 20" Barnes, 4-spindle, power feed, back geared.
Drill press, 34" Barnes.
Drill press, 36" Cincinnati.
Gear hobber, No. 3 Barber-Colman.
Grinder, No. 10 Besly, disk.
Keyseater, Davis, 1/2" capacity.
Lathe, 9"x40" Barnes screw cutting.
Lathe, 12"x5' Seneca Falls.

844 North Wells St., Chicago, Ill.

Lathe, 14"x6' Sebastian.
Lathe, 14x6' Bradford.
Lathe, 18"x5' Advance, also others.
Milling machines: Wisconsin hand; No. 3 1/2 Fox, Nos. 1 & 2 Cincinnati.
Oil extractor, 28" Troy, bot. disc.
Pipe mch., 6" Jarecki, motor drive.
Presses, No. 3 Walsh, Amer. Can.
Hoeft; No. 18-19-20-21 & 21 1/2 Bliss; No. 4 Walsh and Consolidated; No. 4 1/2 American Can, No. 4 Rice, No. 3 1/2 A. Bliss d. a. toggle. 300 ton hydraulic embossing press.
Screw mch., No. 4 B. & S., like new.
Screw machines, Acme, Foster and W. & S.
Shaper, 16" Ohio heavy duty.

All the above Chicago stock immediate delivery. This is only part of our stock. Mail us your list.

SECOND-HAND MACHINERY

FOR SALE BY

**Reliance Machinery Sales Co.,
Brighton Road At Pennsylvania Ave., Pittsburgh, Pa.**

Compressor, 10"x10" American, 175 cubic feet, belted.
Drill, 36" Snyder, sliding head.
Drill, 4" Dreses radial, g. b., s. p. d.
Drills, 34" Prentice plain radial, (2).
Hammers, 100 lb. Cady, belt lift, (2).
Lathes, 20"x8" L. & S. q. c. g., (3).
Lathe, 62"x40" Pittsburgh, t. a., m. d.
Lathes, Libby 22", type B., (4).
Lathes, Libby 26", type C., (2).
Miller, No. 2 Cincinnati plain.
Miller, No. 3 Becker-Brainard plain.
Miller, No. 3 Cincinnati plain.

Miller, 30"x30"x9" Ingersoll, s. & v. heads.
Pipe machine, Jarecki, cap. 3" to 3".
Pipe machine, Jarecki, cap. 1" to 4".
Pipe machine, Cox, cap. 2" to 6".
Pipe machine, Merrill, cap. 1" to 6".
Planer, crank, 16"x14"x14", 1 head.
Press, 86 Niagara, grd. cam drawing.
Shaper, 16" Gould & E., b. g. crank.
Shaper, 20" Gould & E., b. g. crank.
Shaper, 24" Cincinnati, b. g. crank.
Shaper, 24" Stockbridge, b. g. crank.

FOR SALE BY

A. D. White Machinery Co., - 108-114 N. Jefferson St., Chicago
ENGINE LATHES.

11"x 5' South Bend.
14"x 6' Smurr & Kamen.
18"x 7' Chard, d. b. g., p. c.
18"x 9' Bell, d. b. g., p. c.
20"x 8' Hamilton, d. b. g., s. q. c.
20"x 8' Lodge & Shipley, grd. hd.

20"x 8' Reed, s. b. g., p. c.
20"x 8' Reed, motor driven.
22"x16" Davis, d. b. g., q. c.
32"x10" Pond, s. b. g., p. c.
34"x10" Putnam, s. p. g., p. c.
38"x14" Fifield, s. b. g., p. c.

MILLING MACHINES.

No. 0 Rockford, plain.
No. 25 Becker, horizontal.
No. 1 Newton slab.

Model AB Becker, vert., motor dr.
Type "A" Briggs (2).
No. 6 Brainard, Lincoln.

DRILL PRESSES.

50" Mechanics, friction.
26" Barnes, sliding head.
28" Barnes, sliding head.
36" Aurora, sliding head.

2 spindle Guarantee, h. s., b. b.
4 spindle Reed sensitive, 1" cap.
24" No. 24 Foote-Burt heavy duty.
2 spindle 24" Barnes, all grd. gang.

PUNCH

No. 1 Consolidated, grd., (2).
No. 0 American Can.
No. 8 & No. 11 Bliss auto. button presses.

No. 16 Bliss, horn.
19" throat geared punch.
New Swaine o. b. i. presses Nos. 27, 29, 31, 33, 35 and 37.

TURRET LATHES AND

No. 3 Foster, plain head.
20"x5" Bridgeport, (2).
20"x8" Fay & Scott universal.
22"x5" Reed.
21" and 24" Gisholts.
3x36" Jones & Lamson.
18"x10" Milholland.
14" Biggs (2).
No. 1 Garvin, hand, (4).
No. 1 B. & S. auto 1" (2).

SCREW MACHINES.
No. 3 Stecher, hand, (4).
16"x5" Dreses Fox.
18"x6" American Fox.
18"x6" Springfield Fox.
7/16" Cleveland, ratchet feed.
1" Cleveland, semi-auto.
1" Cleveland, friction.
1" Cleveland, jigger.
1" Hartford, (2).
1" Cleveland, jigger.

BOLT CUTTERS AND

14" Acme, double head.
24" Acme single head, (2).
4" Acme single head.

PIPE MACHINES.
4" Saunders (2).
8" Eaton, Cole & Burnham.

MISCELLANEOUS.

Blower, No. 7 Sturtevant, high press.
Boring mch., 24" bar, Binsse horiz.
Gang splitter, takes 21" sheets.
Gang splitter, takes 29" sheet.
Gas engine, 35 h. p. Columbus.
Gas engine, 55 h. p. Bruce-McBeth.
Grinders, No. 2 Woods tool & cutter.
Grinder, No. 2 Oesterlein tool & cut.
Grinder, 10x30 Landis plain.

Grinder, Springfield, 2-wheel wet.
Grinder, Leland & F., wet.
Planer, 30"x30"x10" Pond, 1 head.
Profiler, 2 spindle Putnam.
Riveter, 1" Shuster.
Saw, No. 54 Nutter-Barnes.
Screw slotter, Garvin hor 3/16 to 3/8".
Tapper, No. 2 Garvin, auto.

SECOND-HAND MACHINERY

FOR SALE BY

Noble Machine Company, - **Fort Wayne, Ind.**

KEYSEATER.

One good second-hand No. 0 Baker Keyseater, belt driven. We offer this as it is or rebuilt. Write us for price.

FOR SALE BY

A. A. McLaughlin & Co., - **24 West 2nd St., Cincinnati, Ohio**

Drill, Bickford 3-spindle multiple, capacity 7' 6"\$1,500.
 Drill, Pratt & Whitney universal multiple 1,750.
 Sheets rolls, Niles, 50" between housings, 7 rolls 6" diameter 1,200.

FOR SALE BY

The Enterprise Machinery Co., **28 S. Clinton St., Chicago**

Bolt cutter, 3 st. Acme.....\$2500.	Miller, No. 2 Cincinnati, b. g.....\$ 350.
Boring mill, 36" Niles, 2 hds. 1750.	Pipe machine, 3" Jarecki..... 250.
Gear cutter, B. & S. automatic	Planer, 22"x5', 1 head..... 295.
spur, fine condition..... 350.	Press, horn, bench, new, 150 lb. 120.
Grinder, Bath No. 2 cylindrical	Press, punch, bench 130 lb., 11"
Grinder, univ., all angle, new,	wheel, cap. 4" in 1/16" new. 90.
\$300 worth tools, 2 univ. mtrs. 500.	Punch, sh. & rod c. 4"x4" Doty 350.
Lathe, 12x4 Monitor..... 175.	Punch, L. & A., 2" thru 2"..... 2300.
Lathe, speed, 14x5 slide r., hvy. 125.	Roll, 11' for 4"..... 2500.
Lathe, 19x10 Fitchb., c. r., ck. 295.	Shaper, 16" Baker & Chard.... 425.
Lathe, 23x14 Rahn Carpenter	Shaper, 16" Springfield..... 390.
heavy duty, fine condition... 1100.	Shears, circle, power..... 75.
Miller, 25 Becker, 95%..... 450.	Thread roller to 12"..... 200.

500 other tools. Write us your needs.

FOR SALE BY

Wm. C. Johnson & Sons Machinery Co.,

1001-3-5 N. Sixth St.,

St. Louis, Mo.

LATHES.

18"x 8' Chard.	26"x10' Bridgeford, q. c.
20"x 8' Lodge & Shipley, geared hd.	26"x10' Reed.
21"x 8' Lodge & Davis.	32"x20' Draper, triple geared.
24"x12' Schumacher & Boye.	40"x16' Fitchburg.
24"x12' Lodge & Shipley.	54"x16' Putnam.
25"x16' Niles.	72"x30' triple geared.

SHAPERS.

20" Smith & Mills.	24" Gould & Eberhardt.
20" Gould & Eberhardt.	20" Wetherell travelling head.

PLANERS.

24"x24"x 8' Liberty.	32"x32"x10' Sellers.
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MILLERS.

No. 22 Kempsmith universal.	No. 12 Kempsmith plain.
No. 2 Rockford universal.	No. 3 Becker plain.
No. 9 Kempsmith plain.	

DRILLING MACHINES.

40" New Haven.	6' arm Prentice.
24" Foote-Burt.	4' arm American.
16" Kern high speed.	

MISCELLANEOUS.

Boring mill, 36" turret head.	Marking machine, Mathews.
Boring and drilling machine, horiz.,	Screw machine, 3" Garvin, hand.
No. 2 Pawling & H.	Screw machine, 1" Foster hand.
Cold saw, 28" Q. & C.	Screw machine, 1 1/2" Foster hand.
Gear shaper, 36" Fellows.	Slotter, 6" Sellers.
Grinder, 8"x30" Modern plain.	Turret, 16" Bardons & Oliver, univ.
Hammer 400 lb. board drop.	Wheel press, hydraulic, 84", 300-ton.
Hammer. 1100 lb. Morgan, steam.	

Redface Pulleys

Sheaves and Fly Wheels



PERMANENT: They are permanent, as they are not affected by age, heat, cold or moisture.

RELIABLE: They do not loosen up under vibration or intermittent loading.

RUN TRUE: They run true, steady the line shaft, and have a very small load due to windage.

REDFACE PULLEYS are especially adapted to use on motors, fans, pumps and special machinery.

Catalog mailed promptly upon request

Pyott Foundry Co.

Cast Iron Pulleys, Sheaves and Fly Wheels
328 N. Sangamon St., Chicago, Ill.

**We Are
In the Market
for
Good Up-To-Date
Used Machinery**

What have you to offer?

We buy one machine,
or entire plants.

Vonnegut Machinery Co.
19 W. South St., Indianapolis, Ind.

The New Year Brings New Prices

Now Is The Time To BUY!

An addition to our regular stock list

Chester Bertolette Company

Offices: 1004-5 Commercial Tribune Bldg., CINCINNATI, OHIO

BORING MILLS

72" Betts Heavy Duty, 2 swivel heads, actual swing 80",	\$5,000.00.
42" Bullard Heavy Duty, 1 swivel head, 1 turret head, arranged for motor drive.	
36" Baush & Harris Vertical Boring Mill	\$ 950.00.

ENGINE LATHES

60"x16' Betts,	\$ 800.00.	32"x16' Pittsburgh,	\$1,300.00.
50"x27' New Haven,	1,500.00.	28"x10' New Haven,	850.00.
42"x18' Niles,	1,450.00.	14"x 6' Reed,	275.00.
20"x12' Lodge & Shipley,	600.00.		

GRINDERS

No. 1 Landis,	\$ 750.00.	No. 1 Landis Sur. Grinder	\$ 200.00.
No. 2 Landis,	800.00.	Cincinnati Tool Grinder	
No. 3 Landis,	900.00.	Equal to New,	175.00.

BOLT CUTTERS

Acme Double Head, 1½" capacity, complete with dies,	\$ 425.00.
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RADIAL DRILLS

2-New Morris Latest Type, 4' Radial Drills, gear box dr., tap. att.,	\$1,950.00.
4' American Single Pulley Gear Box Drive tapping attachment,	1,250.00.
6' Niles-Bement-Pond, late type, arranged for mtr. dr., without mtr.,	1,850.00.

PUNCHES

No. 15 Williams & White, 30" throat, architectural jaw, arranged motor drive, complete,	\$1,350.00.
No. 6 Beatty Single End, 48" throat, 1"x1" capacity, new,	1,800.00.
No. 6 Beatty Single End, 36" throat, 1"x1" capacity, new,	1,500.00.
No. 11 Whiting, 24" throat, 1" thru 1"	1,100.00.

SHAPERS

16" Steptoe,	\$ 400.00.	24" Gould & Eberhart,	\$1,050.00.
16" Smith & Mills,	575.00.	28" Queen City,	975.00.

PLANERS

48"x48"x16' Pond, 3 hds.	\$3,250.00.	24"x24"x8' Gray, nearly new.	
60"x60"x16' Pond Plainfield, late type			

WHEEL PRESSES

150 Ton Shaffer Wheelpress, Hydraulic,	\$ 750.00.
250 Ton Hamilton Machine Company Hydraulic,	1,500.00.
Several New Wheelpresses, Hydraulic, reasonably priced.	

SQUARING SHEARS

36"x18 gauge foot power,	\$ 100.00.
48"x14 gauge Niagara, geared power, late type,	495.00.
48"x12 gauge Bliss, geared heavy duty, late type.	

HAMMERS

No. 5 Williams & White Belt Drop Hammer, equal to new,	\$ 450.00.
20,000 lb. Steam Forging Hammer.	

Write for our regular Stock List. It will be of interest to you.

LET'S GET TOGETHER

"New York's Greatest Clearing House—J. J. McCabe Lathe and Machinery Corporation"

It's time to buy— for when the "other fellow" MUST sell then the buyer
—to buy right— best serves himself and his future requirements—
—to buy AT McCABE'S when prices are at their LOWEST, then you may

the highest grade New and Used Tools, because with the Low prices
 you are buying reliable Tools that will give you absolute satisfaction—

BORING MILLS, HORIZ.

- 41" and 4" Bar Niles, Knee Type.
- 4" Bar Bement Miles, Knee Type.
- 3" Bar Betts, Knee Type.

RADIAL DRILLS

- 8" Arm, American, Cone Drive.
- 4" Arm, Bickford, Speed box.
- 4" Arm, Drezgas, Cone Drive.

TURRET LATHES

- 2x24" J. & L. (2) Flat Turret, sliding hd., chucking and bar equipment.
- 3x38" J. & L. Flat Tur., slid. hd., bar equip.
- 20" Potter & Johnston Chucking and Turning machines (2) with 2" Hollow Spil.
- 25" Pond "Rigid Type" rapid traverse to turret, 4" hollow spindle, 32" like new.
- 21" Gisholt, swing in gap 32" like new, Hartford Auto. Screw Machine.

GEAR CUTTERS

- 18" Gleason Bevel Gear Planer, full equip.
- 30" G. & E. Spur and Bevel Gear Cutter.

PLANERS

- 48"x48"x18" Pond M. T. Co., 2 heads.
- 46"x48"x16" Sellers, 3 heads.

GRINDERS

- Universal Landis 16" Swing, 60" centers.
- Universal Landis, 10" swing, 30" centers.
- Universal Iroquois, 12x32" centers.
- Bridgeport Roll Gdr. Table, 66x12", 36" centers, wheel 20x5".

MILLING MACHINES, VERTICAL

- No. 5 Brown & S. auto, feed to table 52".
- No. 2 Cincinnati.

MILLING MACHINES, PLAIN

- No. 3 Cincinnati (3) working surface of table 48x14", overhanging arm.
- No. 22 Brainerd, working surface of table 48"x14" overhanging arm, etc.
- No. 7 Becker Brainerd Mrs. Type.
- Keeneat Milling Machine "Newton", horiz. and vertical spindles, table 60x12".

BENDING ROLLS

- 14'2" between housings, drop end center support for lower rolls.
- "Hilles & Jones," modern style, top roll 11" diam., two lower rolls 8" (one roll grooved), friction clutch pulleys.

HYDRAULIC RIVETING EQUIPMENT

- 8' Gap Bement Miles Bull Riveter, with piston and ram for accumulator overhead crane, hoist, etc., capacity for driving up to 14" rivets.

LATHES

- 34x60" Lo-Swing Fitchburg.
- 36"x14" Bridgeford, grd. hd., q. c. mtr. dir.
- 36"x16" Putnam.
- 36"x20" Putnam.
- 50"x13" American, Triple grd., qk. ch. (3).
- 50"x30" Johnson, triple geared.
- 50"x60" Johnson, triple geared.
- 54"x21" Pond M. T. Co., triple geared.

DOUBLE SPINDLE LATHE

- Slightly used 24-48" swing, 12' bed McCabe, at price equivalent to 26" lathe, but giving you the additional capacity of 48" triple geared lathe as well.
- One 38-60" Swing, 38' bed, 20' Centers.

SLOTTERS

- 24" Stroke (3) Niles-H. P. Co's (Bement-Miles works) with auto. cross, side and circular fds. to table, full equip., complete

IT'S TIME TO BUY

OTHER TOOLS

Crankshaft and Forge Cold Saw, equipped with one 30" and three 24" inserted tooth saw blades, capacity for cutting up to 9" round. "Espan-Lucas," head with saw has travel of 24". "Medart," 6-roll Shaft Straightening Mch., "Medart," 6-roll type, 3-top, 3-bottom, for straightening, round bars, 1 1/2 to 4 1/2" any length. Cutting-off and Centering Mch. "Bement-Miles," for cutting off both ends at the same time of axles & shafts up to 9" diam. Travelling Head Shaper, 12" stroke, Fitchburg Special Column Shaper. Bolt Header, Burdick, 4" capacity. Pulleys (20), 30x8x3 7/16".

Gas Engine, 15 H. P. Fairbanks Morse. Vert. Hydraulic Press, cyl. 14" dia., 12" str. 20-Ton Gantry Crane, 45' span, length of bridge 14', rail base to floor 17'. 20-Ton Air Crane, with 5-ton hoist, travel across 24', travel back about 30', complete with rails.

PUNCHES AND SHEARS

42" Gap Hilles & Jones No. 4 single end, cap. for punching 1 1/2" thru 1", arranged for motor drive, including motor.

36" Cap. Long & Allstatter, double end, cap. for punching 1 1/2" thru 1", belt driven. Portable Punch, Pels.

36" Splitting Shear.

HORIZONTAL PUNCH

60" Gap Hilles & J. No. 6, cap. for punching 3 1/2" hole thru 1 1/2" plate, weight 48,000 lbs., arranged for motor drive but not including motor, absolutely like new.

NEW TOOLS, IMMEDIATE SHIPMENT

NEW LATHES

35 machines in stock, all sizes, 16 to 50" aw., new McCabe, qk.ch., all steel grs. in qk. ch. and apron, 3-step cone, dbl. back grs.

16"x 8' bed, 2 1/2" between centers.

16"x 10' bed, 3 1/2" between centers.

18"x 8' bed, 4 1/2" between centers.

18"x 10' bed, 5 1/2" between centers.

18"x 12' bed, 6 1/2" between centers.

21"x 8' bed, 4 1/2" between centers.

21"x 10' bed, 5 1/2" between centers.

21"x 12' bed, 6 1/2" between centers.

21"x 14' bed, 10 1/2" between centers.

29"x 18' bed, 10 1/2" between centers.

32"x 14' bed, 7' between centers.

32"x 16' bed, 9' between centers.

32"x 20' bed, 13' between centers.

36"x 18' bed, 11' between centers.

3-50"x 14 1/2" bed, "American Tool Works," tri. grd., quick change gear box, at a big reduction from regular new selling price.

NEW SHAPERS

Four in stock, 12 to 16" stroke.

1-12" stroke, plain.

1-14" stroke, plain.

2-16" stroke, plain.

NEW RADIALS

Ten in stock.

4-24" Arms, speed box, single pulley drive.

5-4" Arms, speed box, single pulley drive.

1-3' Arm, speedy-sensitive, tapping att.

NEW BENDING ROLLS

Two sets in stock.

10 1/2" bet. hous'gs. LATEST IMPROVED

TYPE, "HEAVY PATTERN."

10 1/2" between housings, drop end, rolls

set in pyramid form, center support, top

roll 10 1/2" diam. two lower rolls 8" diam.

(1 grooved), cap. 4" plate, weight about

20000 lbs., arr. for either belt or motor dr.

PUNCHES AND SHEARS

New McCabe Standard Heavy Pattern, 30"

throat, weight 40000 lbs., arranged for

motor drive, not including motor.

J. J. McCabe Lathe & Machinery Corporation, 149 Broadway, New York

"The RELIABILITY of McCabe's Used Machinery Is Known the World Over"

Real Investments

Machine Tools

Immediate Delivery

LATHES

- 2 slightly used 48"x26" Lodge & S. selective triple grd. hd., motor dr.
- 1 slightly used 48"x16" L. & S. selective t.g.h., driven by 25 h.p. motor.
- 1 slightly used 42"x26" American selective triple grd. hd., motor dr.
- 4 slightly used 36"x14" L. & S. selective triple grd. head, for motor dr.
- 1 slightly used 26"x10" Greaves-Klusman, 3-step cone, belt drive.
- 3 new 14"x6" Monarch, 3-step cone, quick change, double back geared.
- 5 new 12"x5" Worcester, 3-step cone, belt drive.
- 4 new 14"x6" Flather, 3-step cone, belt drive.

GRINDERS

- 3-12x72 Norton plain.
- 1-10x72 Norton plain.
- 1-No. 79 Heald internal.
- 2-No. 2 Brown & Sharpe universal.
- 1-No. 2 Morse universal.
- 3-No. 75 Heald.
- 1-No. 60 Heald.
- 1-12" No. 22 Heald rotary surface, with magnetic chuck.
- 1-14" P. & W. vert. surface, with quadruple magnetic revolving ck.
- 1-No. 6 Rivett internal grinder.
- 1-10x36 Norton plain.

PLANERS AND SHAPERS

- 1-72x72x20 Pond, 2 rail heads.
- 1-36" Fellows gear shaper.
- 1-24" Smith & Mills shaper.
- 1-24" Ohio shaper.
- 1-20" Kelly shaper.
- 1-14" Smith & Mills shaper.

BORING MILLS

- 3-Used 62" King vertical, 2 swivel heads, for motor drive.
- 3-Used 64" Bullard rapid production, 2 swivel hds., for motor dr.
- 3-Used 52" King vertical, 2 swivel heads on cross rail, for motor dr.
- 1-Used 52" Bullard vert., 2 swivel hds. on cross rail, for motor drive.
- 1-New 44" Bullard maxi-mill; 2 swivel heads on cross rail, for motor drive.
- 1-Used 40" King vertical, 2 swivel heads on cross rail, for motor dr.
- 3-New 36" Bullard New Era type, 1 turret head on cross rail, 1 side head, for motor drive.

BORING MILLS—Continued

- 1-Used 36" Gisholt vert., 1 turret hd. on cross rail, 5-step cone, belt dr.
 - 1-Used No. 33 Lucas horiz., single pulley drive, latest type, 4 1/2" bar.
 - 1-Used No. 31 Lucas horizontal, single pulley drive.
 - 1-Used No. 0 Giddings & Lewis horiz., latest type, sgl. pulley dr.
- All of the above in excellent condition and are real bargains.

MILLING MACHINES

- 3-Model C1 Becker vertical.
- 2-No. 2 Cincinnati vert., 3-st. cone.
- 1-No. 2 Cincinnati vertical, single pulley drive, latest type.
- 1-No. 3 Kempsmith universal, 3-step cone, belt drive.
- 1-No. 2 Cincinnati pl., sgl. pulley dr.
- 1-No. 2S Cin'ti univ., for motor dr.
- 1-No. 3H LeBlond universal.
- 1-No. 2N Potter & Johnston reversible table milling machine.
- 1-66" Newton vertical continuous.
- 2-No. 8C Becker vertical.
- 1-No. 14 Brown & Sharpe universal.
- 1-No. 2 Cincinnati universal.

AUTOMATICS AND TURRET LATHES

- 2-1 1/2" Gridley, 4 spindle.
- 3-No. 52 National Acme.
- 3-No. 56 National Acme.
- 1-24" Model A Cleveland Auto.
- 1-24" Cleveland Automatic.
- 1-44" Cleveland Automatic.
- 4-24" Steidle 6 1/2" spindle.
- 4-No. 3A Warner & Swasey.
- 2-No. 4 Warner & Swasey.
- 1-No. 8 Bardons & Oliver.
- 1-No. 4 Bardons & Oliver.

MISCELLANEOUS

- 2-12" Wm. Sellers Slotters, 5-step cone, belt drive.
- 1-D8 Colburn heavy duty Drill.
- 1-No. 216 Baker Drill.
- 1-No. 315 Baker Drill.
- 1-4" Hamilton Radial Drill, mtr. dr.
- 2-No. 4 Williams & W. Bulldozers.
- 1-New 1 1/2" double spindle National Bolt Cutter.
- 1-300 ton Southwork vertical hydraulic Press.
- 1-No. 59 Toledo Press.
- 1-No. 59 1/2 Toledo Press.

The Empire Machinery Exchange Co., Inc
915 Citizens Bldg., - - - CLEVELAND, OHIO

Priced To Sell Under Present Conditions

Over 400 Machines In Stock At Our Warehouse

BORING MILLS

100" Betts, 3 heads, like new.
76" Betts heavy, modern.
60" Niles-Bement-Pond, hvy., single pulley drive.
60" Bickford, standard, 2 heads, low price.

48" Colburn, 3 heads, modern.
36" Bullard Vertical Turret.
8-24" Bullard turret type.
36" Horizontal Universal, belt driven.
4" Espen-Lucas Horiz., floor type.
3" Betts, Horizontal, knee type.

DRILLS

8" Niles Plain Radial.
6" Baush, Plain Radial, like new.
6" Bickford, Semi-Universal Radial.

5" Niles-Bement-Pond, motor driven.
4" Gang, gear box drive.

LATHES

60"x20" Fifeild, D. C. Motor Drive.
52"x22" New Haven triple geared, pulley drive.
60"x17" New Haven Pulley.
36"x14" Putnam triple geared.
36"x12" Pond triple geared.
30"x12" Johnson.

28"x18" Johnson.
20"x8"x10" American.
20"x8" Lodge & Shipley.
14"x6" Mulliner tool room.
14"x6" Monarch.
12"x5" P. & W.
10"x4" Seneca Falls.

Milling Machines

8-No. 5C Becker Verticals, new, price right.
No. 3 LeBlond, plain, high duty.
No. 5 Becker-Brainard Plain.

No. 2 Kempsmith Universal.
30"x8" Ingersoll Slab.
No. 25 Becker Plain.

PLANERS

34"x84"x13" Sellers, 3 heads, belt driven.
48"x48"x14" Powell, 4 heads, reversible motor drive, complete with electrical equipment.
48"x48"x16" Bement-Miles, 4 heads, belt driven.

42"x42"x12" Pond Machine Tool Co., 2 heads, belt driven.
36"x36"x12" Niles-Bement-Pond, 3 heads.
30"x30"x10" Flather, 2 heads, belt driven.
30"x30"x6" Gray, 3 head, parallel dr.

SHAPERS

2-16" Newark, box table and vise.
4-15" Smith & Mills, box table and vise.

4-15" Hendey, box table and vise.
3-48" Morton, extra heavy, draw-cut.

Miscellaneous

Whiting Punch and Shear, 1" cap.
10" Bement Boiler Plate Rolls.
18" Betts heavy type slotter.

8" New Haven slotter.
Single and double action presses.

Graves Machinery Exchange

Warehouse and R. R. Siding:
Johnston Ave. & Monitor St.,
Jersey City, N. J.

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We HAVE Machine Tools that YOU NEED

David A. Wright

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**New, Used and GUARANTEED Rebuilt
Machinery for Immediate Delivery**

LATHES

No. 2 NILES AXLE, 8' CENTER.
No. 3 NILES AXLE, (NEW).
34" x 60" Lo-Swing.
6" x 60" Lo-Swing.
8" x 60" Lo-Swing.
6" x 84" Lo-Swing.
8" x 84" Lo-Swing.
8" x 108" LO-SWING.
14x6 Reed Prentice, h. d.
16x7 Oliver Tool Room, q. c. g.
16x8 Gisholt turret.
17x6 LeBlond, q. c. g., h. d.
18" Libby 6-hole turret.
18x 8 Oliver tool room.
20x 8 Cisco, q. c. g.
20x 8 Hamilton, s. q. c. g.
20x11 Cisco, q. c. g.
24x12 CISCO, q. c. g.
24x12 Gisholt turret.
24x 6" Steidle turret, 64" hole.
30x12 Putnam, g. h., arr. for motor.
30x12 6" Oliver, all-gear head.
42" Niles car wheel.
52" Niles car wheel.
50x20" FIFIELD, TRIPLE GRD.

SHAPERS

14" Steptoe, b. g. crank.
16" STEPTOE, B. G.
16" Queen City b. g.
20" Walcott b. g.
20" Queen City b. g.
20" STEPTOE, B. G.
24" Lodge & Davis b. g.
24" QUEEN CITY, B. G.

DRILLING MACHINES

22" Superior, b. g., p. f., tapp. attach.
20" Foote-Burt, h. d.
24" Barnes, 2-spindle camel-back.
34" Barnes, b. g., p. f.
36" Mechanics, b. g., p. f.
24" Foadick, radial.
6 spindle Barnes gang.
6 spindle Allen, b. b., h. s.
10 spindle Natco multi., 3" cap.
12 spindle P. & W. mult., 4" cap.
27 spindle Baush mult., 14" cap.
D-4 COLBURN 24", h. d.

GRINDERS

No. 14 GARDNER DISC.
No. 60 HEALD CYLINDER.
No. 14 Bealy disc, ring wheels.
No. 1 W. & M. Surface.
Sterling cutter and reamer.
6x20 FITCHBURG AUTOMATIC PLAIN.
10x30 Landis plain.
12x30 Fitchburg automatic plain.
12x36 FITCHBURG AUTOMATIC PLAIN.

SCREW MACHINES

No. 0 B. & S., SLOTTING ATTACHMENT.
No. 00 B. & S., SLOTTING ATTACHMENT.
No. 2 B. & S., lot equipment.
4" Chicago automatics.
No. 2 Bardons & Oliver, 1" cap.
No. 4 WARNER & SWASEY, P. F.

MILLERS

3" Lees-Bradner internal.
3" Foster internal.
MODEL A. B. BECKER, CIRCULAR TABLE.
No. 14 American plain b. g., p. f.
No. 2 Pratt & Wright.
No. 2 M. U. Garvin universal.

PUNCH PRESSES

No. 3 Morton, o. b. l.
No. 3 Adriance, o. b. l.
No. 3 R. & K., o. b. l.
No. 17 Bliss.
No. 18 Bliss, o. b. l.
No. 19 Bliss, o. b. l.
No. 4 McDonald, o. b. l.
No. 54 WALSH, GEARED.
No. 65-N Bliss, double acting.
No. 68-C 3 Bliss, double acting.
No. 68 W. Bliss, double acting.
No. 594 Toledo, s. s.

MISCELLANEOUS

No. 2 Moore Screw Press.
No. 2 Davis Keyseater.
24" Bullard Boring Mill.
36" Bullard Boring Mill.
52" Baush Boring Mill.
30" ROGERS & HEMPHIL BORING MILL.

Send us your inquiries

SIMMONS

Boring Mills

- 24" Bullard vertical, with side head.
- 34" Bertram vertical, turret head.
- 36" Bullard New Era type vertical, with cutting lubricant system.
- 42" Bullard New Era type vertical, 4-jaw chuck, complete.
- 54" Bullard production mill.
- 12' Betts vertical, 20 h. p. motor.
- 12' Niles pattern boring & turning.

Planers

- 24"x24"x 8' Cincinnati, 1 head.
- 30"x30"x18' Cincinnati, 2 heads.
- 30"x30"x10' W-Powell, 2 heads.
- 36"x36"x20' W-Powell, 4 heads.
- 42"x42"x12' Simmons openside, 2 heads, NEW, (2).
- 48"x48"x20' Ridgeway, 3 heads.
- 48"x48"x20' N.-B.-Pond, 4 hds., NEW.
- 48"x48"x28' Cincinnati, 2 hds., NEW.
- 60"x60"x20' W-Powell, 4 heads.
- 84"x84"x28' Sellers, 4 heads, 40 h. p. motor.

Lathes

- 84"x26' Putnam hvy. duty, motor dr.
- 60"x29'-56" N.-B.-Pond high duty, motor drive, NEW, (6).
- 57"x23' Putnam, cone d., taper att.
- 48"x29'-56" N.-B.-Pond heavy duty, motor driven, NEW, (6).
- 42"x18' Bement-Miles heavy.
- 36"x34' and 44' Bridgeford, heavy duty, all geared head, (7).
- 36"x18' Putnam high duty, NEW.
- 36"x14' Putnam h. duty, motor d., (2).
- 28"x18' Pond, screw cutting, all geared head, complete.
- 27"x24' LeBlond h. pwr., A-I, (15).
- 27"x18' LeBlond high duty, all grd. head, complete, (12).
- 24"x18' LeBlond heavy duty.
- 24"x10' Flather, d. b. g., complete.
- 22"x10' Davenport, q. c. g., complete.
- 21"x11' LeBlond heavy duty.
- 18"x 8' Lodge-Shipley, 4' 6" centers.
- 14"x 6' Monarch, belt drive, (2).
- 9" Porter Cable mfg. lathes, (4).

Radial Drills

- 7' Warren semi-universal.
- 6' Reed-Prentice plain, tapping attachment, (3).
- 6' Pond pl., belt drive, complete, (2).
- 5' Prentice pl., tapping att. (3).
- 5' Bickford pl., arranged motor dr.
- 4' Hammond high speed, NEW.
- 4' Bickford plain, 4 h. p. motor.
- 36" Dreses plain, tapping att.

Millers

- No. 2 LeBlond plain all gear feeds.
- No. 2 Brown-Sharpe vertical.
- No. 3 Hendey plain, std. equip.
- No. 3 Cincinnati h. power plain.
- No. 5 Brown-Sharpe vertical.
- Gooley & Edlund, type A. & B.
- Pratt-Whitney heavy duty slab.
- No. 1 1/2 universal American NEW.
- No. 1 1/2 Plain American NEW.
- No. 36 Chicago hand, with c. s., (2).
- 6x14 P. & W. 6" thread miller.
- P. & W. 4" spline millers, (5).
- Becker large heavy duty hand (15).

Grinders

- 14"x96" Norton plain NEW.
- No. 1 Norton univ. tool-cutter, (2).
- B. & S. planer type surface.
- No. 5 Brown-Sharpe universal.
- No. 4 Besly spiral double disc.
- No. 3 Garvin univ. cutter-surface.

Miscellaneous

- 15" Hendey friction shaper.
- 16" Cincinnati heavy duty shaper.
- 20" Gould-Eberhardt bk. grd. shaper.
- 24" Hendey friction driven shaper.
- 32" Cincinnati hvy. duty shapers (8).
- No. 2-A Warner-Swasey turret lathe.
- No. 1 1/2 Pratt & W. Turret Lathe.
- 10" Bement slotting machine.
- 30-ton Orton-Steinbrenner 8-wheel standard gage locomotive crane, 52' boom, complete.

Simmons Machine Co., Inc.

Albany, N. Y.

801 Singer Bldg., N. Y., 86-88 Exchange St., Buffalo, N. Y.

IN STOCK For Immediate Delivery

BORING MILLS

No. 0 Giddings & Lewis horizontal.
60" Bullard, 2 plain heads.

DRILLING MACHINES

13" Leland-Gifford, h. e., ball bearing, single spindle.
16" Cleveland, h. e., b. b. drill.
6" Gang radial drill.
6" Prentice radial drill.

GEAR CUTTERS

No. 3 Farwell gear hobber.
5" Hercules.

GRINDERS

No. 12 Brown & Sharpe universal. 6"x32" Norton. 8"x40" Morse. 14"x50" Norton.	No. 12 Modern. No. 8 Besly disc grinder. No. 10 Besly disc grinder. Gisholt tool grinder.
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LATHES

12"x 5' Pratt & Whitney toolroom lathe.
16"x 6' Bradford, compound rest.
16"x 8' Hamilton style "A", taper and relieving attachment.
18"x10' Bradford, compound rest, double back gear.
32"x18' Bradford, compound rest.
Porter Cable Mfg. lathe.

MILLING MACHINES

No. 0 Rockford plain. No. 5 Hendey, Lincoln type. No. 6 Whitney hand. Taylor & Fenn vertical. No. 3-B Milwaukee plain. No. 5-B Brown & Sharpe.	No. 3 Becker vertical. No. 13 Brown & Sharpe. No. 5 Garvin plain. 12" P. & W. automatic. Type "A" Briggs miller. No. 32 Kempsmith.
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SCREW MACHINES

No. 0 Foster, plain head, automatic chuck and wire feed.
No. 1 Foster, plain head, automatic chuck and wire feed.
No. 2 Foster, plain head, automatic chuck and wire feed.
No. 1 Pratt & Whitney, automatic chuck and wire feed.

TURRET LATHES

21" Gisholt.
24" Gisholt.
2"x24" Jones & Lamson.
Potter & Johnston.
24" Cleveland, automatic.
14" Warner & Swasey.

PRESSES

No. 23 Toledo, double action.
No. 6 Eames arbor press.

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26" Bridgeford Engine Lathes

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2-26" x 14' Bridgeford Engine Lathes

D. B. G., Q. C., S. C.
Compound and steady rests.
3-step cone for $5\frac{1}{2}$ " belt.
Bed heavily ribbed every 2'.
 $2\frac{1}{4}$ " hollow spindle Tailstock
bearing on V's 20".
8' between centers.
C-C of carriage V's 19".
 $\frac{3}{4}$ " "T" slots on carriage.
C-C of tailstock V's 12".

Screw 2" dia. x 2" pitch.
Front bearing $7\frac{1}{2}$ " l. x $4\frac{1}{4}$ " dia.
(Bronze, ring oiling).
Dia. TS spindle 4".
Rear bearing $5\frac{1}{4}$ " l. x $3\frac{1}{4}$ ".
Swing over carriage 19".
Front gear 3" face.
Swing over compound rest 12".
Double gear $1\frac{3}{4}$ " face.

Price, Each, \$1450.00

1-26" x 16' Bridgeford Double Back Geared, Quick Change Engine
Lathe. Same as above, with 10' centers.

Price, \$1600.00

1-26" x 18' Bridgeford Double Back Geared, Quick Change Engine
Lathe. Same as above, with 10' centers.

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- 1—18"x 8' SCHUMACHER & BOYE, 3-step cone, double back geared head, quick change gear, compound rest, two chucks fitted.
- 1—27"x22' BRIDGEFORD Hvy. Duty Mfg., 2 carriages with pl. rests, semi-change fd., driven by 25 h. p. G. E. 230 v., 400-1200 r. p. m., d. c. motor.
- 1—30"x22' BRIDGEFORD Co's Heavy Duty Manufacturing Lathe, with plain rest, semi-change feed, driven by a 25 h. p. 400 to 1200 r. p. m. motor.
- 1—32"x32' BRIDGEFORD Heavy Pattern six-speed head Engine Lathe, quick change gear, compound rest, driven by a 27½ h. p. Westinghouse, 230 volt, 550 to 1100 r. p. m. adjustable speed motor, with apron control.
- 1—38"x44' BRIDGEFORD Hvy. Pattern Grd. Hd., q. c. g., c. r. driven by 25 h. p. Westhouse 230 v., 400-1200 r. p. m. motor, apron control.
- 1—42"x18' AMERICAN Tool Works, Geared Hd. Lathe, raised in the sand to swing 54" qk. ch. gr., comp. r., driven by a 20 h. p. General Electric 230 volt, 400 to 800 r. p. m., mounted on floor and belted to sgl. pulley drive.
- 1—46"x24' HOUSTON & GAMBLE Hvy. Pattern, q. c. g., c. r., driven by 25 h. p. Reliance 230 v., 400-1200 r. p. m. motor, apron control; 7" raising bks.

Shaper

- 1—26" GOULD & EBERHARDT with vise, table support, c.s. and wrenches.

Drills

- 1—21" CINCINNATI BICKFORD, stationary head bk. gr., pw. f., auto. stop.
- 1—24" No. 25 Swing FOOTE-BURT High Duty Drill.
- 1—6" arm WESTERN Mche. Tool Co's Heavy Pattern Plain Radial, tapping att., with 2 square tables, driven by a 15 h. p. Western 230 v., 1150 r. p. m. motor.

Slotter

- 1—48" NILES Geared Slotter, square table, 50" dia., cross travel 28", long. travel 48". All geared feeds driven by a 20 h. p. General Elec. 230 volt, 400 to 800 r. p. m. motor, with E. C. M. Control (push button type), motor mounted on floor and belted to driving pulley.

Horizontal Boring Machine

- 1—24" No. 2 sp. ROCKFORD Hor. Boring, Milling & Drilling Mche. spindle travel 24", floor plate 60x72". Driven by a 5 h. p. Western Electric 230 volt, 500 to 1500 r. p. m. motor. Two boring bars.

Turret Lathe

- 1—No. 3-A W. & S. Universal Turret Lathe with considerable equipment.

Cold Saws

- 1—32" Blade NEWTON, cap. 9½" round stock. Travel of carriage 20". Driven by 220 h. p. General Elec. 230 volt, 400 to 800 r. p. m. motor mounted on floor and belted direct to driving pulley. Two 32" Blades.
- 1—48" NEWTON Crank Shaft Cold Saw & cutting-off mche., two tables, travel of carriage 30". Driven by a 250 h. p. Western Gen. Elec. Co. 230 v., 400 to 1200 r. p. m. motor. With two 42" and two 48" inserted tooth blades.

Pipe Machine

- 1—2½" to 8" No. 9½ MERRILL Pipe Threading & Cutting-off Machine.

Grinders

- 1—No. 20 Safety Emery Wheel Co's 220 volt, 700 r. p. m., motor driven floor grinder. Diameter of arbor 3". Capacity for taking 30x4 Wheels.
- 1—3½, 16x42 LANDIS Univ., Magnetic Chuck for grinding ball bearing rings.

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- 1—Weigel 21" Sliding Head Drill, belt driven.
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LATHES

- 2—Hamilton 20"x10" Style B Lathe, 3 step, DBG. bk. gear.
- 2—Rockford 9"x12" Geared Head Manufacturing Lathes.
- 1—Rockford 16"x6" Cone Head High Power Manufacturing Lathe.
- 1—Rockford 16"x6" Tool Room Lathe.

HAMMER

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SAW

- 1—Peerless 6"x6" Hack Saw.
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GRINDERS

- 1—Schmidt Internal Grinder.
- 1—Norton No. 2 Universal Tool and Cutter Grinder.
- 1—Gardner No. 4 Disc Grinder.
- 1—Gardner No. 14 Disc Grinder.
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- 48"x36' Niles, raising blocks to swing 60".
- 36"x14' Niles, face plate drive, 104" centers.
- 28"x15' Schumacher & Boye, quick change, 9' centers.
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- 24"x14' Lodge & Shipley, quick change, taper attachment.
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- 60" Gould & Eberhardt Gear Cutter, practically new.
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- 42" Bullard Vertical, 2 swivel heads.
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- 24" Gould & Eberhardt, back geared, sliding head.
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- 84" Diamond Heavy Face Grinder, motor drive.
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- 16" NEW Cincinnati Barker Back Geared Crank Shaper.
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| 2—10x36" Thompson Full Univ. | 1—Wells Cutter and Tool Grinder. |
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| 1—Grand Rapids Drill, 24" cap. | 1—Used No. 2 Woods Cutter. |
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| 2—16" Streine B. G. (new). | 1—Each 16, 18, 21, 24" Hollingsworth |
| 4—16" Whipp S. G. Crank. | B. G. Crank (new). |
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Millers

- | | |
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| 5—Rockford, all univ., Nos. 1 1/2-2-2 1/2, | 10—No. 32 Kempsmith Lincoln Type. |
| 3-st. cone, d. b. g., sgl. pulley dr. | 1—No. 1 Kempsmith Univ., vert. att. |
| 1—No. 2 American Plain (used). | 2—No. 1 1/2 American Plain. |
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| 1—No. 2 Pratt & Whitney Trimming. | 1—Doty Combined Punch & Shear, |
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- 19—24", with 2 1/2", 4 1/2" and 6 1/2" h. s., chucking equip., qck. ret., rapid traverse.

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- 1—Baush Multiple, arranged for 24 spindles; now with 12 spindles; takes 60" bet. columns; drills in any circle 12-48" dia.; approximate weight 30,000 lbs.
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Lathes

- 4—Ideal Precision Lathes, 7" swing, comp. slide, grinding attachment.
3—Ames Precision Lathes, 8" swing, compound slide.
2—12 & 14" x 6" Worcester Tool Room, taper attachment, pan and collet.
1—14" x 6" Flather Engine Lathe, screw cutting, s. b. g.
1—Used Blaisdell 22"x10" b. g. Engine Lathe.
1—Each Sidney Heavy Duty Lathes, 15, 17, 19, 23 and 27" by 6, 8, 10, 12 and 14" beds, d. b. g., 3-step cone, q. c. g.
1—Each Sidney Medium Pattern Lathes, 14, 16, 18 and 20" by 6, 8 and 10" beds, d. b. g., 3-step cone, q. c. g.
1—25"x8" Economy Heavy Duty Single Purpose Lathe, d. b. g., 3-step cone, c. r., hollow spindle, quick change feed.
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| 1—24"x24"x 8" Powell. | 1—32"x32"x10" Fitchburg. |
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| Gear cutter, 26" Brown & S. No. 3. | Shear, square, 12' Bertsch, 14 ga. |
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- 1—Safety Emery Wheel Grinder, Planer Type.
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- 1—No. 3 Brown & Sharpe Automatic Gear Cutter.
- 1—6x32 Norton Grinder.
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- 1—36" Fellows Gear Shaper.
- 1—9x14 Porter Cable Lathe.
- 1—20x14 Boye & Emmes Engine Lathe.
- 4—No. 3-A Warner & Swasey Turret Lathes.
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8220, 8232, 8244, 8256, 8268, 8280, 8292, 8304, 8316, 8328, 8340, 8352, 8364, 8376, 8388, 8400, 8412, 8424, 8436, 8448, 8460, 8472, 8484, 8496, 8508, 8520, 8532, 8544, 8556, 8568, 8580, 8592, 8604, 8616, 8628, 8640, 8652, 8664, 8676, 8688, 8700, 8712, 8724, 8736, 8748, 8760, 8772, 8784, 8796, 8808, 8820, 8832, 8844, 8856, 8868, 8880, 8892, 8904, 8916, 8928, 8940, 8952, 8964, 8976, 8988, 9000, 9012, 9024, 9036, 9048, 9060, 9072, 9084, 9096, 9108, 9120, 9132, 9144, 9156, 9168, 9180, 9192, 9204, 9216, 9228, 9240, 9252, 9264, 9276, 9288, 9300, 9312, 9324, 9336, 9348, 9360, 9372, 9384, 9396, 9408, 9420, 9432, 9444, 9456, 9468, 9480, 9492, 9504, 9516, 9528, 9540, 9552, 9564, 9576, 9588, 9600, 9612, 9624, 9636, 9648, 9660, 9672, 9684, 9696, 9708, 9720, 9732, 9744, 9756, 9768, 9780, 9792, 9804, 9816, 9828, 9840, 9852, 9864, 9876, 9888, 9900, 9912, 9924, 9936, 9948, 9960, 9972, 9984, 9996, 10008, 10020, 10032, 10044, 10056, 10068, 10080, 10092, 10104, 10116, 10128, 10140, 10152, 10164, 10176, 10188, 10200, 10212, 10224, 10236, 10248, 10260, 10272, 10284, 10296, 10308, 10320, 10332, 10344, 10356, 10368, 10380, 10392, 10404, 10416, 10428, 10440, 10452, 10464, 10476, 10488, 10500, 10512, 10524, 10536, 10548, 10560, 10572, 10584, 10596, 10608, 10620, 10632, 10644, 10656, 10668, 10680, 10692, 10704, 10716, 10728, 10740, 10752, 10764, 10776, 10788, 10800, 10812, 10824, 10836, 10848, 10860, 10872, 10884, 10896, 10908, 10920, 10932, 10944, 10956, 10968, 10980, 10992, 11004, 11016, 11028, 11040, 11052, 11064, 11076, 11088, 11100, 11112, 11124, 11136, 11148, 11160, 11172, 11184, 11196, 11208, 11220, 11232, 11244, 11256, 11268, 11280, 11292, 11304, 11316, 11328, 11340, 11352, 11364, 11376, 11388, 11400, 11412, 11424, 11436, 11448, 11460, 11472, 11484, 11496, 11508, 11520, 11532, 11544, 11556, 11568, 11580, 11592, 11604, 11616, 11628, 11640, 11652, 11664, 11676, 11688, 11700, 11712, 11724, 11736, 11748, 11760, 11772, 11784, 11796, 11808, 11820, 11832, 11844, 11856, 11868, 11880, 11892, 11904, 11916, 11928, 11940, 11952, 11964, 11976, 11988, 12000, 12012, 12024, 12036, 12048, 12060, 12072, 12084, 12096, 12108, 12120, 12132, 12144, 12156, 12168, 12180, 12192, 12204, 12216, 12228, 12240, 12252, 12264, 12276, 12288, 12300, 12312, 12324, 12336, 12348, 12360, 12372, 12384, 12396, 12408, 12420, 12432, 12444, 12456, 12468, 12480, 12492, 12504, 12516, 12528, 12540, 12552, 12564, 12576, 12588, 12600, 12612, 12624, 12636, 12648, 12660, 12672, 12684, 12696, 12708, 12720, 12732, 12744, 12756, 12768, 12780, 12792, 12804, 12816, 12828, 12840, 12852, 12864, 12876, 12888, 12900, 12912, 12924, 12936, 12948, 12960, 12972, 12984, 12996, 13008, 13020, 13032, 13044, 13056, 13068, 13080, 13092, 13104, 13116, 13128, 13140, 13152, 13164, 13176, 13188, 13200, 13212, 13224, 13236, 13248, 13260, 13272, 13284, 13296, 13308, 13320, 13332, 13344, 13356, 13368, 13380, 13392, 13404, 13416, 13428, 13440, 13452, 13464, 13476, 13488, 13500, 13512, 13524, 13536, 13548, 13560, 13572, 13584, 13596, 13608, 13620, 13632, 13644, 13656, 13668, 13680, 13692, 13704, 13716, 13728, 13740, 13752, 13764, 13776, 13788, 13800, 13812, 13824, 13836, 13848, 13860, 13872, 13884, 13896, 13908, 13920, 13932, 13944, 13956, 13968, 13980, 13992, 14004, 14016, 14028, 14040, 14052, 14064, 14076, 14088, 14100, 14112, 14124, 14136, 14148, 14160, 14172, 14184, 14196, 14208, 14220, 14232, 14244, 14256, 14268, 14280, 14292, 14304, 14316, 14328, 14340, 14352, 14364, 14376, 14388, 14400, 14412, 14424, 14436, 14448, 14460, 14472, 14484, 14496, 14508, 14520, 14532, 14544, 14556, 14568, 14580, 14592, 14604, 14616, 14628, 14640, 14652, 14664, 14676, 14688, 14700, 14712, 14724, 14736, 14748, 14760, 14772, 14784, 14796, 14808, 14820, 14832, 14844, 14856, 14868, 14880, 14892, 14904, 14916, 14928, 14940, 14952, 14964, 14976, 14988, 15000, 15012, 15024, 15036, 15048, 15060, 15072, 15084, 15096, 15108, 15120, 15132, 15144, 15156, 15168, 15180, 15192, 15204, 15216, 15228, 15240, 15252, 15264, 15276, 15288, 15300, 15312, 15324, 15336, 15348, 15360, 15372, 15384, 15396, 15408, 15420, 15432, 15444, 15456, 15468, 15480, 15492, 15504, 15516, 15528, 15540, 15552, 15564, 15576, 15588, 15600, 15612, 15624, 15636, 15648, 15660, 15672, 15684, 15696, 15708, 15720, 15732, 15744, 15756, 15768, 15780, 15792, 15804, 15816, 15828, 15840, 15852, 15864, 15876, 15888, 15900, 15912, 15924, 15936, 15948, 15960, 15972, 15984, 15996, 16008, 16020, 16032, 16044, 16056, 16068, 16080, 16092, 16104, 16116, 16128, 16140, 16152, 16164, 16176, 16188, 16200, 16212, 16224, 16236, 16248, 16260, 16272, 16284, 16296, 16308, 16320, 16332, 16344, 16356, 16368, 16380, 16392, 16404, 16416, 16428, 16440, 16452, 16464, 16476, 16488, 16500, 16512, 16524, 16536, 16548, 16560, 16572, 16584, 16596, 16608, 16620, 16632, 16644, 16656, 16668, 16680, 16692, 16704, 16716, 16728, 16740, 16752, 16764, 16776, 16788, 16800, 16812, 16824, 16836, 16848, 16860, 16872, 16884, 16896, 16908, 16920, 16932, 16944, 16956, 16968, 16980, 16992, 17004, 17016, 17028, 17040, 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18768, 18780, 18792, 18804, 18816, 18828, 18840, 18852, 18864, 18876, 18888, 18900, 18912, 18924, 18936, 18948, 18960, 18972, 18984, 18996, 19008, 19020, 19032, 19044, 19056, 19068, 19080, 19092, 19104, 19116, 19128, 19140, 19152, 19164, 19176, 19188, 19200, 19212, 19224, 19236, 19248, 19260, 19272, 19284, 19296, 19308, 19320, 19332, 19344, 19356, 19368, 19380, 19392, 19404, 19416, 19428, 19440, 19452, 19464, 19476, 19488, 19500, 19512, 19524, 19536, 19548, 19560, 19572, 19584, 19596, 19608, 19620, 19632, 19644, 19656, 19668, 19680, 19692, 19704, 19716, 19728, 19740, 19752, 19764, 19776, 19788, 19800, 19812, 19824, 19836, 19848, 19860, 19872, 19884, 19896, 19908, 19920, 19932, 19944, 19956, 19968, 19980, 19992, 20004, 20016, 20028, 20040, 20052, 20064, 20076, 20088, 20100, 20112, 20124, 20136, 20148, 20160, 20172, 20184, 20196, 20208, 20220, 20232, 20244, 20256, 20268, 20280, 20292, 20304, 20316, 20328, 20340, 20352, 20364, 20376, 20388, 20400, 20412, 20424, 20436, 20448, 20460, 20472, 20484, 20496, 20508, 20520, 20532, 20544, 20556, 20568, 20580, 20592, 20604, 20616, 20628, 20640, 20652, 20664, 20676, 20688, 20700, 20712, 20724, 20736, 20748, 20760, 20772, 20784, 20796, 20808, 20820, 20832, 20844, 20856, 20868, 20880, 20892, 20904, 20916, 20928, 20940, 20952, 20964, 20976, 20988, 21000, 21012, 21024, 21036, 21048, 21060, 21072, 21084, 21096, 21108, 21120, 21132, 21144, 21156, 21168, 21180, 21192, 21204, 21216, 21228, 21240, 21252, 21264, 21276, 21288, 21300, 21312, 21324, 21336, 21348, 21360, 21372, 21384, 21396, 21408, 21420, 21432, 21444, 21456, 21468, 21480, 21492, 21504, 21516, 21528, 21540, 21552, 21564, 21576, 21588, 21600, 21612, 21624, 21636, 21648, 21660, 21672, 21684, 21696, 21708, 21720, 21732, 21744, 21756, 21768, 21780, 21792, 21804, 21816, 21828, 21840, 21852, 21864, 21876, 21888, 21900, 21912, 21924, 21936, 21948, 21960, 21972, 21984, 21996, 22008, 22020, 22032, 22044, 22056, 22068, 22080, 22092, 2

PRE-WAR PRICES:

In order to avoid moving our stock to our new Wareroom, we are offering our entire stock of used Machines at sacrifice prices. Do not ask us for a list but specify exactly what you want and we will quote you by return mail or wire, if necessary. The following are a few Machines picked at random from our stock:

LATHES

- | | |
|---|----------------------------------|
| 9" to 13" Barnes, h. s., cp. r., new. | 24"x12" Fay & Scott, |
| 10"x5" Summit, nearly new, (5). | 25"x14 Schumacher & Boye, |
| 12-15-16 and 18 O. & S., h.s., c.r., new. | 36"x28" Putnam, geared head, |
| 18"x 8" Fitchburg, hol. spdl., cp. r. | 12"x5" Precision tool room, (5). |
| 20"x10" Hamilton, double back gear. | 8"x60" Fitchburg Lo-Swing. |
| 24"x12" Fitchburg. | 21" and 24" Gisholt, turret. |

TURRET LATHES and SCREW MACHINES

- | | |
|---------------------------------------|---------------------------------|
| 21" Steinle, 64" hol. spdl., grd. hd. | No. 2 Warner & Swasey hol. hex. |
| 14" Tilted turret hand screw mche. | Nos. 52, 53 & 56 National Acme. |
| 2x24 & 3x36 J. & L. dbl. equipment. | 21" and 24" Gisholt. |
| 14" S. & K. hand screw machine. | No. 0 B. & S. Automatics, (2). |

SHAPERS

- | | |
|----------------------------|-----------------------------------|
| 14" Niles, traveling head. | 24" Walcott, geared. |
| 14" Smith & Mills, crank. | 20" Smith & Mills, geared. |
| 16" Rockford, crank. | 16" Springfield, crank, back grd. |

PLANERS

- | | |
|----------------------------------|-------------------------------|
| 24x24x 6' Hendey. | 54x54x16' Sellers, 4 heads. |
| 24x24x 6' Pease. | 60x60x17' Betts, 2 heads. |
| 36x36x10' Sellers, 2 heads. | 60x60x20' Sellers, 4 heads. |
| 44x44x12' Pond, 4 heads. | 66x66x20' New Haven, 2 heads. |
| 48x48x16' Bement-Miles, 2 heads. | 84x84x32' Putnam, 4 heads. |

PRESSES

- | | |
|---|---------------------------------------|
| No. 856 Toledo, 36" stroke, 15,000 lbs. | No. 3 Robinson, 4300 lbs., o. b. l. |
| Perkins, dbl. crank, 16x24 bolster. | No. 6-A Willard 3400 lbs. inclinable. |
| No. 35 Niagara, Stiles type, (2). | No. 14 Robinson 1500 lbs. inc., (3). |

DRILLS and RADIALS

- | | |
|--------------------------------------|---------------------------------|
| Henry & Wright sgl. spdl., high spd. | 24", 26" and 28" sliding head. |
| 34" Canedy-Otto plain, new. | 3" Bickford plain, cone driven. |
| Sensitive 1, 2, 3, 4 and 6 spindle. | 44" Prentice, gear box drive. |

MILLING MACHINES

- | | |
|------------------------------------|--|
| No. 25 Becker plain, (3). | No. 14 B. & S. plain. |
| Ames, Lincoln type, 10"x40" table. | No. 2 H Brown & Sharpe plain. |
| No. 12 Brown & Sharpe. | Briggs type "A" high duty, 24x8 table. |
| No. 3 Brainard, 30x7 table. | No. 32 Kemp Smith Lincoln type, (3). |

GRINDERS

- | | |
|--|-------------------------------------|
| No. 78 W. & M. wet surface. | Capital, internal, practically new. |
| 6x18 Landis, plain. | Landis 10x24 universal. |
| Madison, int., for cylinders in block. | Litter 10x20 universal. |
| Gisholt, universal tool. | 36" and 66" Yates plate. |

MISCELLANEOUS

- | | |
|-----------------------------------|---|
| Rand saws, metal, Klemm, (2). | Hammers, 40 lb. Bradley, helve, (2). |
| Boring mill, 12", 2 swivel heads. | Hammer, Toledo, 5,000 lb. fric. brd. |
| Brake, 8' Keene, for 18 gauge. | Hammer, Canton, 6,000 lb. b.g. drop. |
| Broaching mch., Lapointe No. 1. | Motors, 1 to 50 h.p., 3 ph., 220 v., G.E. |
| Cold saw, Higley No. 114. | Oil groover, Carvin, nearly new. |
| Compressors, 9x8 and 12x10, new. | Pumps, Gould triplex, 64x8" & 7x8". |
| Gear cutter, G. & E. 36". | Shears, 5' & 8' for 10 gauge. |
| Gear cutter, Whiton 36"x94" face. | Shear, 8' Robinson for 18 gauge. |

Osborne & Sexton Machinery Co.

Columbus, Ohio

Dayton Office: 1118 Lindsey Building, Phone Main 1524

FIRST-CLASS USED TOOLS

VERTICAL BORING MILLS

34" Bullard, 1 head.
36" Gisholt, 1 head.
42" Bullard, 2 heads.

61" Bullard Maxi-Mill.
66" Niles, 2 heads (2).
84" Betts, heavy type, 2 heads.

HORIZONTAL BORING MILLS

No. 2 Rockford motor driven.
No. 2 Barrett 5" spindle, (2).
No. 33 Lucas.

No. 0 Giddings & Lewis, (3).
Universal Machine Co., 3" spindle, (2).

DRILLING MACHINES

No. 25 Foote-Burt heavy duty.
4-spd. Foote-Burt, adj. heads.
14-spd. Baush mult., No. 4 taper.

3' Fosdick radial, sgl. pulley.
5' American radial, sgl. pulley.
6' Western radial, motor driven.

LATHES

60"x34' Houston Stanwood Gamble g. h., q. c., motor driven.
52"x18' American g. h., q. c., motor driven.
36"x44' Bridgeford, g. h., q. c., motor driven.
32"x32' Bridgeford, q. c., motor driven.
30"x22' Bridgeford plain turning, motor driven.
No. 3-A Warner & Swasey Turret Lathe.

GRINDERS

5 No. 60 Heald Grinders, long tables.

PLANERS

Open side.
30"x30"x10' Cleveland.
48"x48"x12' Cleveland.
60"x60"x14' Cleveland.

Straight side.
48"x48"x16' Pond, 4 hds. motor dr.
60"x60"x16' Pond, 4 hds. motor dr.
84"x84"x22' Pond, 2 rail hds., belt.

R. M. WEBB MACHINERY CO., 405 Hippodrome Bldg.
CLEVELAND, OHIO

Second-Hand Machinery

BORING MACHINES.

Binsse horizontal, 4" bar.
Four 24" Bullard vertical turret lathes, 4-jaw chuck, latest pattern.
Four 30" Bullard vertical boring mills, 3-jaw combination chuck.
36" Bullard vert. turret lathe, Rapid production type, 3-jaw chuck.
50" Baush vertical, two swivel heads.
Four 72" Cincinnati, latest pattern, two swivel heads.

DRILLING MACHINES.

Four No. 117 Moline "Hole Hog" heavy, single spindle.
No. 11 NATCO multi-driller, 12" round head, 8 spindles.
No. 310 Baker Bros. high speed heavy duty, with compound table.
36" Wm. E. Gang plain radial.

GEAR HOBBER.

18" No. 2 Adams-Farwell. 18" Gould & Eberhardt.

GRINDERS.

No. 70 Heald internal. No. 10 Brown & Sharpe plain,
No. 17 Besly disc, NEW. with water tank and pump.

PLANERS.

24"x24"x 6' Cincinnati. 36"x36"x 8' Niles, 2 heads.
36"x28"x 6' Cincinnati. 36"x36"x10' Niles, 2 heads.
30"x36"x 8' Cincinnati widened, 60"x60"x12' Gleason, 3 heads.
2 heads. 66"x66"x17' Harrisburg, 2 hds.

PRESSES.

No. 8 Cleveland, NEW. Six No. 27 Swaine inclin., NEW.

SHAPERS.

16" Columbia back grd. crank. Four 20" Walcott, shifting belt.

Marshall & Huschart Machinery Co.
17 S. Jefferson St., Chicago, Ill.

Miscellaneous Bargains

Air Compressor, G. E. centrifugal, 1100 cu. ft. capacity; motor driven.

Balancing Machine, No. 66 Defiance.

Blowers, No. 6 Sirroco; Root No. $\frac{1}{2}$ rotary; Beach Russ No. 9 pressure.

Bolt Cutter, No. 3 D. & H. 1st.

Centering Machines, Whiton 4"x24", 4"x36"; Hurlbut & Rogers No. 4.

Filing Machine, Cochrane-Bly.

Keyseaters, No. 1 & No. 2 Davis; No. 2 Baker.

Moulding Machines, Tabor 24" combination.

Polishing Jacks; Diamond, Roth, Robinson, Bennett & O'Connell.

Profilers, Garvin, Betts, Putnam.

Presses, Barnes Screw; 30-ton Lucas forcing; LaPointe Nos. 2 & 3 broaching, No. C-2 Ferracute o. b. i.; No. C-82 Ferracute internal notching.

Metal Band Saws, Clark 30th.

Oil Separators, DeLaval and American.

Riveters, Bilton, Grant, No. 5-A High Speed.

Shear, Niagara 42nd.

Slotters, Garvin die; No. 0 L. & W. horizontal oscillating.

Tappers, 2-X & 2-H Garvin; Excelsior $\frac{1}{2}$ " National 4-spindle.

Write for February Bargain List of Drill Presses, Lathes, Millers, Grinders, Hobbers, etc.

Peninsular Machinery Co.
431 E. Jefferson Ave., Detroit, Mich.

Exceptional Offerings

American Heavy 18"x6' Turret Lathe.
 Baird No. 2 Kick Presses.
 Cincinnati 10"x26" Gear Cutter.
 Cleveland $\frac{3}{8}$ " to $\frac{1}{2}$ " Automatic Screw Machine.
 "Colburn" No. 0 Key Seater.
 Gould & Eberhardt 12"x6" Gear Cutter.
 Grant $\frac{3}{8}$ " Rivet Spinning Machine.
 Heald No. 60 Cylinder Grinder Serial No. 696.
 Hendey 18"x6' Brass Finisher's Lathe.
 "Ingle" 12" Gear Tooth Rounding Machine.
 Nutter Barnes 6" Cold Cutting-Off Saw.
 Peerless 6"x6" High Speed Power Metal Hack Saw.

(Selected from our Boston Stock of
HI-GRADE USED Machine Tools)

W. H. J. Fitzgerald & Co.

New and Used Machine Tools

165 High Street,

Boston, Massachusetts

New and Used Machinery

NEW

- 1—26x12' 6" Quick Change Geared Head Oliver Lathe.
 - 1—18x10' Quick Change, Double Back Geared Oliver Engine Lathe.
 - 1—18x 8' Quick Change, Double Back Geared Oliver Engine Lathe.
 - 1—16x 7' Quick Change, Double Back Geared Oliver Engine Lathe.
 - 1—No. 2-B Open Type H. S. 4-Spindle Drill Press.
 - 1—No. 2-B Open Type H. S. 2-Spindle Drill Press.
 - 1—No. 1 Cleveland Miller.
 - 1—16" Potter & Johnston Shaper.
 - 1—Wade-American Bench Lathe.
 - 1—No. 4 Starke Bench Lathe.
 - 1—No. 3 Starke Bench Lathe.
 - 3—No. 1—6x6 Racine Metal Hack Saw Machines.
- Full line Electric Drills and Grinders.

USED

- 1—No. 2 Klemm Metal Band Saw.
- 1—No. 1 Shinn Metal Band Saw.
- 3—No. 16 Bliss Horning Presses, with adjustable tables.
- 2—Chicago Automatics.
- 1—No. 44 Williams Cutting-Off Machine with regular equipment.
- 3—20" Wheel and Lever Feed Drill Presses.
- 1—30" B. G. Power Feed Drill Press.

W. L. ROMAINE MACHINERY CO.

214 SYCAMORE STREET, MILWAUKEE, WIS.

Second Hand Machine Tools

BORING MACHINES.

4" bar Detrick & Harvey floor type.
No. 3A Universal horiz., table type.
No. 2 Beaman & Smith, floor type,
4" spindle, motor drive.
2 1/2" bar Bement-Niles horizontal.

No. 1-3" Lucas horizontal.
34" Colburn vertical, turret head.
38" Niles vertical, 2 heads.
42" Bullard vertical, 2 heads.

DRILLS.

1 spindle Henry & Wright b. b.
3-sp. Henry & Wright sens. b. b.
3 spindle Taylor & Fenn sensitive.
20" Prentice Bros. sliding head, b. g.
23" Rockford, tapping att.
24" Pratt & Whitney, b. g. & p. f.
42" Cinn.-Bick. sliding head, b. g.,
p. f., cone drive, tapping att.

No. 1 Rockford horizontal.
20" Baker Bros. style M, 4 h. p. mtr.
No. 310 Baker Bros. heavy duty.
6-sp. Hendey, pwr. feed to each spdl.
No. 30-12 spindle Bausch multiple.
No. 12-8 spindle Natco multiple.
No. 22-16-spindle Natco multiple.

GRINDERS.

3"x18" Norton, plain cylindrical.
6"x32" Norton, plain cylindrical.
10"x48" B. & S. plain cylindrical.
10"x30" Landis plain cylindrical.
No. 18-12"x120" Landis plain cyl.
18"x96" Norton plain, self contained
motor drive.
No. 3 Modern universal.
12"x40" Landis universal.
12"x60" Landis universal.

10" Garrigus rotary surface.
B. & S., oscillating ball race.
No. 11 Rivett oscillating.
No. 5 Rivett hand feed oscillating.
No. 34 Van Norman internal.
No. 6 Rivett internal.
20" Besly disc.
No. 6 A Bryant internal.
18" Ney double disc.
No. 60 Heald cylinder.

LATHES.

No. 5 Rivett bench, slide rest.
11x5 Seneca Falls, c. r., p. c. f.
13"x6" Willard c. r., p. c. f.
14"x6" Reed c. r., p. c. f., t. a.
16"x8" Flather, q. c., c. r., p. c. f.
18"x8" Prentice Pros. geared hd., ck.
18"x6" Hendey c. r., p. c. f., tap. att.
20"x19" Reed, c. r., p. c. f.

22"x8" Schumacher-Boye, c. r., p. c. f.
22"x24"x8" Lodge & Shipley selective
head, manufacturing.
26"x12" Putnam, c. r., d. b. g.
32"x14" Hamilton, c. r., p. c. f.
38"x20" New Haven, c. r., p. c. f.
56"x24" Wood & Light, c. r., p. c. f.

MILLERS.

No. 14 Garvin plain.
Rivett hand, precision.
No. 2 Cincinnati plain, all feeds.
No. 3 Cincinnati plain, cone drive.
No. 4 Cincinnati plain, all feeds.
No. 2-A Kempsmith plain, b. g.

No. 1 1/2 LeBlond univ., motor drive.
No. 2 LeBlond univ., belt drive.
Nos. 3 & 4 Cincinnati high pwr. vert.
No. 4-B Becker vertical.
No. 12 B. & S. Manufacturing.

TURRET MACHINES.

16" Acme univ. friction back gear.
20" Steinle heavy duty, geared head.
20x10 Fay & Scott univ. turret lathe.
24x10 Lodge & Davis turret.
24" Gisholt turret, 6" hollow spdl.
Fay automatic turret lathe.
2"x24" J. & L. flat turret, bar equip.
3"x36" J. & L. chuck or bar equip.

3 1/2"x44" Cincinnati flat turret, bar
and chuck equip.
4" Bardous & Oliver turret, motor.
No. 2 1/2 Garvin screw machine.
No. 3 Windsor w. f. screw mach.
4"-4 spindle National Acme auto.
1 1/2"-4 spindle National Acme auto.

MISCELLANEOUS.

Broaching mach., Nos. 4 & 5 J. N.
Lapointe.
Compressor, 8x8 Clayton single air.
Gear cutter, 36"x9" B. & S. spur.
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Planer, 36x36x12 Cincinnati, 4 heads.

Planer, 36x30x14 Cincinnati, 3 heads.
Planer, 48x48x15 Sellers, 3 heads.
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 Conradson Geared Head Lathe, 26"x14".
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 30—Fox No. 3½ and Bristol No. 0 Milling Machines.
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 g. c. g.

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 c. s.

MISCELLANEOUS

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- 7-16"x 6' Reed.
- 1-16"x 7' Reed.
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- 21-18"x 8' Boye & Emmes, belt fd.
- 8-18"x 8' Boye & Emmes, q. c. g.
- 1-18"x10' Whitcomb-B., gd. hd.
- 21-19"x 8' LeBlond, q. c. g., c. r.
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- 31-19"x 8' LeBlond, p. f. turret.
- 14-20"x 8' LeBlond, c. r., q. c. g.
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- 4-No. 7 1/2 4-sp. National Acme automatic screw machines.
- 1-No. 6 B. & S. screw machine.
- 42-No. 7-H Becker Lincoln millers.
- 63-No. 3 1/2 Fox, power feed millers.
- 2-type B 3 1/2" Briggs millers.
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- 2-No. 4-B Becker vertical miller.
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Thomas Elevator Co., 31 S. Heyne Av., Chicago
Weaver Mfg. Co., Springfield, Ill.

Anderson Improved Balancing Ways

Ever-Ready—Sensitive—Reliable



They need no adjusting. The rotating discs made of chilled iron run in specially designed ball bearings and are exceptionally sensitive.

Made in various sizes for balancing pulleys, gin brushes, turbine rotors, crank shafts, polishing wheels, fly wheels, etc.

"Swing"	20"	40"	60"	72"	96"
Greatest distance between standards.....	20"	30"	30"	66"	88"
Capacity in lbs.	1000	2000	2000	5000	10000
Approx. shipping weight.....	45	90	150	350	650
Code	Bend	Bnd	Bes	Bab	Ben

Full details on request

Anderson Bros. Mfg. Co.
1915 Kishwaukee St., Rockford, Ill.

30% Saving

Two 17"x12' LeBlond Engine Lathes

I bought these Lathes before present business depression, and must sacrifice them to raise money. They are the very latest improved LeBlond Lathes, are brand new, and have never been off original skids. They are the Heavy Duty Quick Change type, take in 8' 3" between centers, and are equipped with double friction back gear, compound rest, pan bed, and countershaft.

These Lathes cost me \$1760.00 each f. o. b. Cincinnati, and for cash I will sacrifice them for \$1250.00 each.

Address: Box 10,
Care A. H. Hitchcock, 1220-1235 Caxton Bldg., Chicago, Ill.

Classified Finding Index

Air Guns

Frowell Co., Wm., Cincinnati

Angle Plates

Boston Scale & Mehe. Co., Roxbury, Mass.
Fairbanks Company, The, New York
Germanow-Simon Machine Wks., Rochester
Field Brothers, Co., Inc., Beverly, Mass.
Whiting & Comstock, Hartford, Conn.

Arbors, Roller Grip

Alert Tool Co., Philadelphia

Arbors, Solid

Nicholson & Co., W. H., Wilkes-Barre, Pa.
E. O. Partridge 2047 W. Lake St., Chicago

Automatics

National Acme Co., Cleveland.
New Britain Machine Co., New Britain, Conn.

Balancing Ways

Anderson Bros. Mfg. Co., Rockford, Ill.

Ball Bearings

Abbott Ball Co., Hartford, Conn.
Gwilliam Co., The, 23 Flatbush Ave., Brooklyn,
New York

Balls, Brass, Bronze and Steel

Abbott Ball Co., Hartford, Conn.
Gwilliam Co., The, 23 Flatbush Ave., Brooklyn,
New York

Band Saw Machines, for Metal

Armstrong-Blum Mfg. Co., 341 N. Francisco
Av., Chicago

Barrels, Tumbling

Abbott Ball Co., Hartford, Conn.
Becally-Jones & Co., Ry. Exch. Bldg., Chicago

Belt Shifter

Kremer-Cummins Machine Co., Cleveland

Bench Legs, Steel

New Britain Mehe. Co., New Britain, Conn.

Bending Machines, Hand and Power

Armstrong-Blum Mfg. Co., 341 N. Francisco
Ave., Chicago
Hendley & Whittmore Co., Beloit, Wis.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Lewthwaite Mehe. Co., T. H. 417 E. 31st., N. Y.
Lourie Mfg. Co., Springfield, Ill.
Pedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Bending Rolls, Plate and Angle

Ryerson & Son, Jos. T., Chicago
Wickes Bros., Saginaw, Mich.

Blow Torch, Gas-Electric

North American Mfg. Co., Cleveland

Blue Printing Machines

Paragon Machine Co., Rochester, N. Y.
Wickes Brothers, Saginaw, Mich.

Boring Bars

Alert Tool Co., Philadelphia
Madison Mfg. Co., Muskegon, Mich.
Pedrick Tool & Machine Co., Philadelphia
Ready Tool Co., Bridgeport, Conn.
Rigid Tool Holder Co., Washington, D. C.
Underwood Corp., H. B., Philadelphia

Boring Bars, Cylinder

Pedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Boring, Drilling and Milling Machines, Horizontal

Barnes Co., W. F. & John, Rockford, Ill.
Beaman & Smith Co., Providence, R. I.
Carroll Fdry. & Mehe. Tool Co., Bucyrus, Ohio
Pawling & Harnischfeger Co., Milwaukee
Ryerson & Son, Jos. T., Chicago
Simmons Machine Co., Albany, N. Y.

Boring Machines, Horizontal

Avey Drilling Machine Co., Cincinnati
Pedrick Tool & Machine Co., Philadelphia

Boring and Turning Machines, Vertical

Simmons Machine Co., Albany, N. Y.
Turner Machine Co., Danbury, Conn.

Bowden Wire Mechanism

Gwilliam Co., The, 23 Flatbush Ave., Brooklyn,
New York

Broaches

Lagerholm Co., E. 9 S. Clinton St., Chicago
Velco Mfg. Co., Inc., Greenfield, Mass.

Broaching Machines

Simmons Machine Co., Albany, N. Y.

Bushings, Brass and Bronze

Bunting Brass & Bronze Co., Toledo, Ohio

Case Hardening Compound

Buchanan Chemical Co., C. G., Cincinnati

Casters for Trucks

Hamilton Caster & Mfg. Co., Hamilton, Ohio

Centers, Index

Abrasive Mch. Tool Co., E. Providence, R. I.
Brown & Sharpe Mfg. Co., Providence, R. I.
Carter & Hakes Mch. Co., W. Winsted, Conn.
Dichow Machinery Co., Fred C., 3504 W.
Lake St., Chicago
Whiting & Comstock, Hartford, Conn.

Chains, Power Transmission

Cullman Wheel Co., 1344 Altgeld St., Chicago
Whitney Mfg. Co., Hartford, Conn.

Chasers

Modern Tool Co., Erie, Pa.
National Acme Co., Cleveland

Chucking Machines

New Britain Mehe. Co., New Britain, Conn.

Chucks, Air

Frontier Chuck & Tool Co., Buffalo, N. Y.

Chucks, Centering

McCrosky Tool Corporation, Meadville, Pa.
Thomas Elevator Co., 31 S. Hoyne Ave.,
Chicago

Chucks, Draw-in and Thrust

Hardinge Bros., 1770 Bortean Av., Chicago

Chucks, Drill

Hartford Special Mch. Co., Hartford, Conn.
Jacobs Mfg. Co., Hartford, Conn.
McCrosky Tool Corporation, Meadville, Pa.
Modern Tool Co., Erie, Pa.
Scully-Jones & Co., Ry. Exch. Bldg., Chicago
Thomas Elevator Co., 31 S. Hoyne Ave.,
Chicago
Weaver Mfg. Co., Springfield, Ill.

Classified Finding Index

Chucks, Drill and Tap

McCroskey Tool Corporation, Meadville, Pa.
Modern Tool Co., Erie, Pa.
Peter Bros. Mfg. Co., Algonquin, Ill.
Scully-Jones & Co., Ry. Exch. Bldg., Chicago

Chucks, Keyway Cutting

Scully-Jones & Co., Ry. Exch. Bldg., Chicago

Chucks, Lathe

Thomas Elevator Co., 31 S. Heyne Ave.
Chicago

Chucks, Magnetic

Heald Machine Co., Worcester, Mass.

Chucks, Wrenchless

Thomas Elevator Co., 31 S. Heyne Ave.
Chicago

Clutches, Friction

Edgemont Machine Co., Dayton, Ohio
Milwaukee Shaper Co., Milwaukee, Wis.

Cold Saws

Burke Machine Tool Co., Conneaut, Ohio
Cochrane-Bly Co., Rochester, N. Y.
Fairbanks Company, The, New York
Peter Bros. Mfg. Co., Algonquin, Ill.

Collets, Lathe and Screw Machine

Hardinge Bros., 1770 Berceau Ave., Chicago
Morrison Machine Products Co., Inc.,
Rochester, N. Y.

Contract Work Wanted

Chicago Ferrule & Nut Co., 880 Lill Ave.,
Chicago

Couplings, Flexible

Cooper Flexible Transmission Co., Inc.,
Brooklyn

Cranes, Hand Power

Euclid Crane & Hoist Co., Euclid, Ohio
Northern Engineering Works, Detroit, Mich.
Fawling & Harnischfeger Co., Milwaukee, Wis.
Weaver Mfg. Co., Springfield, Ill.

Cranes, Portable

Candey-Otto Mfg. Co., Chicago Heights, Ill.
Canton Foundry & Mch. Co., Canton, Ohio
Weaver Mfg. Co., Springfield, Ill.

Cranes, Traveling

Euclid Crane & Hoist Co., Euclid, Ohio
Northern Engineering Works, Detroit, Mich.
Fawling & Harnischfeger Co., Milwaukee, Wis.

Crank Pin Turning Machine

Pedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Cutters, Adjustable

Fairbanks Company, The, New York
McCroskey Tool Corporation, Meadville, Pa.
Madison Mfg. Co., Muskegon, Mich.

Cutters, Bolt

Lewthwaite Co., Geo. A., 116 Walker St., N. Y.

Cutters, Keyseating

Lagerholm Co., E., 2 S. Clinton St., Chicago
Scully-Jones & Co., Ry. Exch. Bldg., Chicago
Whitney Mfg. Co., Hartford, Conn.

Cutters, Milling

Brown & Sharpe Mfg. Co., Providence, R. I.
Clough, R. M., Meriden, Conn.
Genesee Mfg. Co., Rochester, N. Y.
Lagerholm Co., E., 2 S. Clinton St., Chicago
Mebach Tool & Machine Co., Boston
Whitney Mfg. Co., Hartford, Conn.

Cutting-Off Machines

Davis Machine Tool Co., Rochester, N. Y.
Etna Mfg. Co., Toledo, Ohio
Peter Bros. Mfg. Co., Algonquin, Ill.

Cylinder Boring Machines, Portable

Pedrick Tool & Machine Co., Philadelphia
Stow Flexible Shaft Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Cylinder or Dome Facing Machines

Underwood Corp., H. B., Philadelphia

Die Heads, Self-Opening

Modern Tool Co., Erie, Pa.
Murchey Machine & Tool Co., Detroit, Mich.
National Acme Company, Cleveland

Dicing Machines

Henry & Wright Mfg. Co., Hartford, Conn.

Dies, Pipe Threading

Signal & Kooler Mch. Wks., Edwardsville, Ill.

Dies, Screw and Thread Cutting

Hardinge Brothers, 1770 Berceau Av., Chicago
National Acme Co., Cleveland

Dies, Self-Opening Adjustable

Modern Tool Co., Erie, Pa.
Murchey Mch. & Tool Co., Detroit, Mich.
Rickert-Shafer Co., Erie, Pa.
Victor Tool Co., Inc., Waynesboro, Pa.

Dogs, Machine

Ready Tool Co., Bridgeport, Conn.

Drilling Heads for Square Holes

Fairbanks Company, The, New York

Drilling Machine Heads

Harris Engineering Co., Bridgeport, Conn.
Sellew Machine Tool Co., Pawtucket, R. I.
United States Drill Head Co., Cincinnati
United States Machine Tool Co., Cincinnati

Drilling Machines, Bench

Avery Drilling Machine Co., Cincinnati
Barnes Co., W. F. & John, Rockford, Ill.
Burke Machine Tool Co., Conneaut, Ohio
Candey-Otto Mfg. Co., Chicago Heights, Ill.
High Speed Hammer Co., Rochester, N. Y.
Beed Co., Francis, Worcester, Mass.
Taylor & Fenn Co., Hartford, Conn.

Drilling Machines, Horizontal

Fawling & Harnischfeger Co., Milwaukee, Wis.

Drilling Machines, Multiple Spindle

Avery Drilling Machine Co., Cincinnati
Detroit Machine Tool Co., Detroit, Mich.
Edlund Machinery Co., Inc., Cortland, N. Y.
Henry & Wright Mfg. Co., Hartford, Conn.
National Acme Co., Cleveland
Reed Co., Francis, Worcester, Mass.
Sipp Machine Co., Paterson, N. J.
Taylor & Fenn Co., Hartford, Conn.

Classified Finding Index

Drilling Machines, Post

Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Henry & Wright Mfg. Co., Hartford, Conn.
Mueller Machine Tool Co., Cincinnati
Silver Mfg. Co., Salem, Ohio

Drilling Machines, Radial

Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Henry & Wright Mfg. Co., Hartford, Conn.
Mueller Machine Tool Co., Cincinnati
Pawling & Harnischfeger Co., Milwaukee, Wis.
Ryerson & Son, Jcs. T., Chicago
Silver Mfg. Co., Salem, Ohio
Taylor & Fenn Co., Hartford, Conn.
Sipp Machine Co., Paterson, N. J.
Wickes Bros., Saginaw, Mich.

Drilling Machines, Sensitive

Avey Drilling Machine Co., Cincinnati
Burke Machine Tool Co., Conneaut, Ohio
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Edlund Machinery Co., Inc., Cortland, N. Y.
Fenn Mfg. Co., Hartford, Conn.
Hardinge Brothers, 1770 Bortess Ave., Chicago
Henry & Wright Mfg. Co., Hartford, Conn.
Hess Co., Francis, Worcester, Mass.
Sipp Machine Co., Paterson, N. J.
Taylor & Fenn Co., Hartford, Conn.
United States Machine Tool Co., Cincinnati
Wisconsin Electric Co., Racine, Wis.

Drilling, Milling and Boring Machines, Vertical

Aurora Tool Works, Aurora, Ind.
Knight Machinery Co., W. B., St. Louis, Mo.

Drilling Machines, Vertical

Aurora Tool Works, Aurora, Ind.
Avey Drilling Machine Co., Cincinnati
Barnes Co., W. F. & John, Rockford, Ill.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Davis Machine Tool Co., Rochester, N. Y.
The Fairbanks Company, New York
Henry & Wright Mfg. Co., Hartford, Conn.
Hinckley Machine Works, Hinckley, Ill.
Minster Machine Co., Minster, Ohio
Silver Mfg. Co., Salem, Ohio
Sipp Machine Co., Paterson, N. J.
Taylor & Fenn Co., Hartford, Conn.

Drilling and Tapping Attachments

Aurora Tool Works, Aurora, Ind.
Harris Engineering Co., Bridgeport, Conn.
Henry & Wright Mfg. Co., Hartford, Conn.
McCroskey Tool Corporation, Meadville, Pa.
Modern Tool Co., Erie, Pa.
Reed Co., Francis, Worcester, Mass.
Sipp Machine Co., Paterson, N. J.
Turner Machine Co., Danbury, Conn.

Drills, Center

Cordill Manufacturing Co., Detroit, Mich.

Drills, Portable Pneumatic

Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago
Keller Pneumatic Tool Co., Grand Haven, Mich.

Drills, Portable Electric

Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago
Standard Electric Tool Co., Philadelphia
Stow Flexible Shaft Co., Philadelphia
Wisconsin Electric Co., Racine, Wis.

Dust Handling Equipment

Knickerbocker Co., Jackson, Mich.

Emery Stands

Blount Co., J. G., Everett, Mass.
Partridge, E. O., 2047 W. Lake St., Chicago

Emery Wheel Dressers and Cutters

Cleveland Plus Cleaner Mfg. Co., Cleveland
Precision Truing Mch. & Tool Co., Clevel.
Taylor & Fenn Co., Hartford, Conn.

Facing Heads, Automatic

Mummert-Dixon Co., Hanover, Pa.

Feeders, Oil and Soda Water

New Britain Machine Co., New Britain, Conn.

Filing Machines

Cochrane-Bly Co., Rochester, N. Y.
Johnson & Biddle Tool Co., Elkhart, Ind.

Filing and Sawing Machines

Johnson & Biddle Tool Co., Elkhart, Ind.

Flexible Shafts

Stow Flexible Shaft Co., Philadelphia, Pa.
Strand & Co., N. A., 649 Washington Blvd., Chicago

Forges

Canedy-Otto Mfg. Co., Chicago Heights, Ill.

Forgings, Drop

Western Tool & Mfg. Co., Springfield, Ohio

Forgings, Hollow Bored

American Hollow Boring Co., Erie, Pa.

Furnaces

Bennett Co., W. R., Elmwood, Conn.
Strong, Carlisle & Hammond Co., Cleveland

Furniture, Machine Shop

New Britain Machine Co., New Britain, Conn.
Western Tool & Mfg. Co., Springfield, Ohio

Gauges, Amplifying, Snap and Plug

Aings Tool, Die and Machine Works, Geo. H., Springfield, Ohio

Gauges, Taper

Hartford Special Mch. Co., Hartford, Conn.
Way Co., A. F., Hartford, Conn.

Gear Cutting Machines

Brown & Sharpe Mfg. Co., Providence, R. I.

Gears

Merkle-Korff Gear Co., 313 S. Clinton St., Chicago

Grinding Machines, Bench

Blount Co., J. G., Everett, Mass.
Partridge, E. O., 2047 W. Lake St., Chicago
Ransom Mfg. Co., Oshkosh, Wis.

Grinding Machines, Cutter, Reamer and Tool

Barnes Co., W. F. & John, Rockford, Ill.
Blount Co., J. G., Everett, Mass.
Clough, R. M., Meriden, Conn.
Grand Rapids Grinding Machine Co., Grand Rapids, Mich.
Greenfield Machine Co., Greenfield, Mass.
Manhattan Machine & Tool Works, Grand Rapids, Mich.

Modern Tool Co., Erie, Pa.

Mummert-Dixon Co., Hanover, Pa.
National Acme Co., Cleveland
Ransom Mfg. Co., Oshkosh, Wis.
Simmons Machine Co., Albany, N. Y.
Thompson Grinder Co., Springfield, Ohio
Wilmarth & Morgan Co., Grand Rapids, Mich.

Grinding Machines, Cylinder

Heald Machine Co., Worcester, Mass.
Whitney & Son, Baxter D., Winchendon, Mass.

Classified Finding Index

Grinding Machines, Cylindrical

Brown & Sharpe Mfg. Co., Providence, R. I.
Detroit Machine Tool Co., Detroit, Mich.
Greenfield Machine Co., Greenfield, Mass.
Manhattan Machine & Tool Works., Grand Rapids, Mich.
Modern Tool Co., Erie, Pa.
Ott Grider Co., Indianapolis, Ind.
Schmidt Co., R. L., Davenport, Iowa
Simmons Machine Co., Albany, N. Y.
Thompson Grider Co., Springfield, Ohio

Grinding Machines, Die

Abrasive Mche. Tool Co., E. Providence, R. I.
Manhattan Machine & Tool Works., Grand Rapids, Mich.
Modern Tool Co., Erie, Pa.
Reid Bros. Co., Inc., Beverly, Mass.
Thompson Grider Co., Springfield, Ohio
Wilmarth & Morman Co., Grand Rapids, Mich.

Grinding Machines, Disc

Ransom Mfg. Co., Oshkosh, Wis.
Sellew Machine Tool Co., Pawtucket, R. I.

Grinding Machines, Drill

Grand Rapids Grinding Machine Co., Grand Rapids, Mich.
La Salle Tool Co., La Salle, Ill.
Ransom Mfg. Co., Oshkosh, Wis.
Wilmarth & Morman Co., Grand Rapids, Mich.

Grinding Machines, Face

Ransom Mfg. Co., Oshkosh, Wis.
Taylor & Fenn Co., Hartford, Conn.
Thompson Grider Co., Springfield, Ohio

Grinding Machines, Gage

Abrasive Mche. Tool Co., E. Providence, R. I.

Grinding Machines, Hob

Harris Engineering Co., Bridgeport, Conn.

Grinding Machines, Internal

Heald Machine Co., Worcester, Mass.
Modern Tool Co., Erie, Pa.
Ott Grider Co., Indianapolis, Ind.
Taylor & Fenn Co., Hartford, Conn.
Thompson Grider Co., Springfield, Ohio
Whitney & Son, Baxter D., Winchendon, Mass.
Wilmarth & Morman Co., Grand Rapids, Mich.

Grinding Machines, Oilstone

Mummert-Dixon Co., Hanover, Pa.

Grinding Machines, Portable

Independent Pneumatic Tool Co., 666 W. Jackson Blvd., Chicago
Mummert-Dixon Co., Hanover, Pa.
Standard Electric Tool Co., Cincinnati
Stow Flexible Shaft Co., Philadelphia
Strand & Co., N. A., 549 Washington Blvd., Chicago
Wisconsin Electric Co., Racine, Wis.

Grinding Machines, Snagging

Grand Rapids Grinding Machine Co., Grand Rapids, Mich.
Manhattan Machine & Tool Works., Grand Rapids, Mich.

Grinding Machines, Surface

Abrasive Mche. Tool Co., E. Providence, R. I.
Heald Machine Co., Worcester, Mass.
La Salle Tool Co., La Salle, Ill.
Ransom Mfg. Co., Oshkosh, Wis.
Reid Brothers Co., Inc., Beverly, Mass.
Thompson Grider Co., Springfield, Ohio
Wilmarth & Morman Co., Grand Rapids, Mich.

Grinding Machines, Tap

Grand Rapids Grinding Machine Co., Grand Rapids, Mich.

Grinding Machines, Universal

Brown & Sharpe Mfg. Co., Providence, R. I.
Grand Rapids Grinding Machine Co., Grand Rapids, Mich.

Greenfield Machine Co., Greenfield, Mass.
Modern Tool Co., Erie, Pa.
Ott Grider Co., Indianapolis, Ind.
Simmons Machine Co., Albany, N. Y.
Thompson Grider Co., Springfield, Ohio
Wilmarth & Morman Co., Grand Rapids, Mich.

Grinding Wheel Dressers

Miller & Sons, Otto A., Detroit, Mich.

Hack Saw Machines

Armstrong-Blum Mfg. Co., 341 N. Francisco Av., Chicago
Western Tool & Mfg. Co., Springfield, Ohio

Hammers, Belt & Motor Driven

Beaudry & Co., Boston

Hammers, Power

Nazel Engineering & Mch. Wks., Philadelphia

Hammers, Riveting

High Speed Hammer Co., Rochester, N. Y.
Quickwork Co., St. Marys, Ohio

Heads, Dividing

Dickow Machinery Co., Fred C., 3504 W. Lake St., Chicago
Simmons Machine Co., Albany, N. Y.
Willard-Middletown Machine Co., Cincinnati

Heads, Index

Dickow, Fred C., 3504 W. Lake St., Chgo.

Hobs

Lagerholm Co., E., 9 S. Clinton St., Chicago

Hoists, Air

Independent Pneumatic Tool Co., 666 W. Jackson Blvd., Chicago
Northern Engineering Works, Detroit, Mich.

Hoists, Electric

Euclid Crane & Hoist Co., Euclid, Ohio
Northern Engineering Works, Detroit, Mich.
Thomas Elevator Co., 31 S. Hoys Ave., Chicago
Weaver Mfg. Co., Springfield, Ill.

Hoists, Electric Traveling

Euclid Crane & Hoist Co., Euclid, Ohio
Northern Engineering Works, Detroit, Mich.
Fawling & Harnischfeger Co., Milwaukee, Wis.

Hoists, Portable

Canton Foundry & Machine Co., Canton, Ohio

Holders and Counterbores

Manufacturers Machine Products Co., Detroit, Mich.

Jigs, Fixtures, Tools, Etc.

Alingo Tool, Die and Machine Works, Geo H., Springfield, Ohio
Hartford Special Mch. Co., Hartford, Conn.
Hinchey Machine Works, Hinchey, Ill.
Potter Tool & Machine Works, S. A., 79 E. 130th St., New York
Way Co., A. F., Hartford, Conn.
Whiting & Comstock, Hartford, Conn.

Joints, Universal

Ainslie Mche. & Tool Works, Hartford, Conn.
Cooper Flexible Transmission Co., Inc., Brooklyn

Keyseating Machines

Bucher-Smith Co., East Liverpool, Ohio
Chattanooga Mch. Co., Chattanooga, Tenn.
Davis Machine Tool Co., Rochester, N. Y.
National Machine Tool Co., Cincinnati
Whitney Mfg. Co., Hartford, Conn.

Lathe Accessories and Attachments

Hardinge Bros., 1770 Berneau Ave., Chicago
McCrosky Tool Corporation, Meadville, Pa.
Modern Tool Co., Erie, Pa.
Sidney Tool Co., Sidney, Ohio
Simmons Machine Co., Albany, N. Y.

Classified Finding Index

Lathes, Bench

Blount Co., J. G., Everett, Mass.
Hardinge Brothers, 1770 Berteau Ave., Chicago
Potter Tool & Machine Works, S. A.,
79 E. 130th St., New York

Lathes, Engine

Barnes Co., W. F. & John, Rockford, Ill.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Davis Machine Tool Co., Rochester, N. Y.
Hardinge Bros., 1770 Berteau Ave., Chicago
Lehmann Machine Co., St. Louis, Mo.
Monarch Machine Tool Co., Sidney, Ohio
Mueller Machine Tool Co., Cincinnati
Ryerson & Son, Jos. T., Chicago
Sidney Tool Co., Sidney, Ohio
Willard Machine Tool Co., Cincinnati
Wickes Bros., Saginaw, Mich.

Lathes, Foot Power

Barnes Co., W. F. & John, Rockford, Ill.

Lathes, Horizontal Turret

Davis Machine Tool Co., Rochester, N. Y.
Steinle Turret Machine Co., Madison, Wis.

Lathes, Short Cut

Sidney Tool Co., Sidney, Ohio

Lathes, Speed and Hand

Blount Co., J. G., Everett, Mass.

Lockers, Shelving and Cupboards, Steel
Terry's Equipment Co., Grand Rapids, Mich.

Mandrels, Expanding

Alert Tool Co., Philadelphia
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Western Tool & Mfg. Co., Springfield, Ohio

Mandrels, Solid

Nicholson & Co., W. H., Wilkes-Barre, Pa.

Measuring Devices

Van Keuren Co., The, Boston

Metal Cutting Machines, Sheet

Quickwork Co., St. Marys, Ohio
Ryerson & Son, Jos. T., Chicago
Savage Co., W. J., Knoxville, Tenn.
Way Co., A. F., Hartford, Conn.

Microgages

Van Keuren Co., The, Boston

Milling Attachments

Ainge Tool, Die and Machine Works, Geo. H.,
Springfield, Ohio
Brown & Sharpe Mfg. Co., Providence, R. I.
Burke Machine Tool Co., Conneaut, Ohio
Hinckley Machine Works, Hinckley, Ill.
Knight Machinery Co., W. B., St. Louis, Mo.
Porter-Cable Machine Co., Syracuse, N. Y.
Potter Tool & Machine Works, S. A.,
79 E. 130th St., New York
Whiting & Comstock, Hartford, Conn.
Willard-Middletown Machine Co., Cincinnati

Milling Machines, Bench

Burke Machine Tool Co., Conneaut, Ohio
Carter & Hakes Mch. Co., W. Winsted, Conn.
Hardinge Brothers, 1770 Berteau Ave., Chicago
Simmons Machine Co., Albany, N. Y.

Milling Machines, Hand

Burke Machine Tool Co., Conneaut, Ohio
Carter & Hakes Mch. Co., W. Winsted, Conn.
Hardinge Bros., 1770 Berteau Ave., Chicago
United States Machine Tool Co., Cincinnati
Whitney Mfg. Co., Hartford, Conn.

Milling Machines, Horizontal

Beaman & Smith Co., Providence, R. I.

Milling Machines, Plain

American Milling Machine Co., Cincinnati
Beaman & Smith Co., Providence, R. I.
Brown & Sharpe Mfg. Co., Providence, R. I.
Burke Machine Tool Co., Conneaut, Ohio
Cochrane-Bly Co., Rochester, N. Y.
Hardinge Bros., 1770 Berteau Ave., Chicago
Ryerson & Son, Jos. T., Chicago

Milling Machines, Portable

Fedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Milling Machines, Universal

American Milling Machine Co., Cincinnati
Brown & Sharpe Mfg. Co., Providence, R. I.
Cochrane-Bly Co., Rochester, N. Y.
Ryerson & Son, Jos. T., Chicago

Milling Machines, Vertical

Beaman & Smith Co., Providence, R. I.
Brown & Sharpe Mfg. Co., Providence, R. I.
Burke Machine Tool Co., Conneaut, Ohio
Clogb, R. M., Meriden, Conn.
Cochrane-Bly Co., Rochester, N. Y.
Hardinge Bros., 1770 Berteau Ave., Chicago
Knight Machinery Co., W. B., St. Louis, Mo.
Taylor & Fenn Co., Hartford, Conn.

Mills, Adjustable Hollow

Genesee Mfg. Co., Rochester, N. Y.

Motors, Electric

Reliance Electric & Eng. Co., Cleveland
Wisconsin Electric Co., Racine, Wis.

Nut Facing Machines

Victor Tool Co., Inc., Waynesboro, Pa.

Oil Cups

Gits Bros. Mfg. Co., 1940 S. Kilbourn Ave.,
Chicago
Tucker, W. C. & F. C., Hartford, Conn.

Oil Hole Covers

Tucker, W. C. & F. C., Hartford, Conn.

Pattern Shop Machinery

Cochrane-Bly Co., Rochester, N. Y.
Silver Mfg. Co., Salem, Ohio
Towsley Mfg. Co., John T., Cincinnati

Pipe Bending Machines

Fedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Pipe Cutting and Threading Machines

Bignall & Keeler Mch. Wks., Edwardsville, Ill.
Simmons Machine Co., Albany, N. Y.

Planer Attachment, Radius

Underwood Corp., H. B., Philadelphia

Planer Attachment, Slotting

Moore Co., H. A., Rochester, N. Y.

Planer Tools, Circular

Underwood Corp., H. B., Philadelphia

Planers, Valve Seat, Portable

Fedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Planing Machines, Metal

Fairbanks Co., The, New York
Ryerson & Son, Jos. T., Chicago

Pneumatic Tools

Independent Pneumatic Tool Co., 600 W.
Jackson Blvd., Chicago
Keller Pneumatic Tool Co., Grand Haven,
Mich.

Classified Finding Index

Polishing and Buffing Machines

Mount Co., J. G., Everett, Mass.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
New Britain Machine Co., New Britain, Conn.
Partridge, E. O., 2047 W. Lake St., Chicago
Stow Flexible Shaft Co., Philadelphia
Wilmarth & Morsman Co., Grand Rapids
Wisconsin Electric Co., Racine, Wis. [Mich.]

Presses, Arber

Atlas Press Co., Kalamazoo, Mich.
Bartlett, Edwin E., Nashua, N. H.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Lourie Mfg. Co., Springfield, Ill.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Weaver Mfg. Co., Springfield, Ill.

Presses, Branching

Atlas Press Co., Kalamazoo, Mich.
Bartlett, Edwin E., Nashua, N. H.
Lourie Mfg. Co., Springfield, Ill.

Presses, Foot

Atlas Press Co., Kalamazoo, Mich.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Lourie Mfg. Co., Springfield, Ill.
Rockford Iron Works, Rockford, Ill.
Taylor & Fenn Co., Hartford, Conn.
Partridge, E. O., 2047 W. Lake St., Chicago

Presses, Power

Hendley & Whittemore Co., Beloit, Wis.
Loughborough-Jordan T. & M. Co., Elkhart, Ind.
Rockford Iron Works, Rockford, Ill.
Willard-Middletown Machine Co., Cincinnati

Presses, Punch

Enterprise Machinery Co., 32 S. Clinton St., Chicago
Henry & Wright Mfg. Co., Hartford, Conn.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Lourie Mfg. Co., Springfield, Ill.
Loughborough-Jordan T. & M. Co., Elkhart, Ind.
Lourie Mfg. Co., Springfield, Ill.
Partridge, E. O., 2047 W. Lake St., Chicago
Rockford Iron Works, Rockford, Ill.

Presses, Screw

Atlas Press Co., Kalamazoo, Mich.
Lourie Mfg. Co., Springfield, Ill.
Manhattan Machine & Tool Works, Grand Rapids, Mich.
Flets & Sons, Carl, Cincinnati
Towale Mfg. Co., John T., Cincinnati
Weaver Mfg. Co., Springfield, Ill.

Pulley Machinery

Avery Drilling Machine Co., Cincinnati

Pulleys, Iron, Solid and Split

Enterprise Machinery Co., 32 S. Clinton St., Chicago
Pyott Fdry. Co., 328 N. Sangamon St., Chicago

Pumps, Lubricating

Michigan Machine Co., Detroit, Mich.

Punch Press Feeds

Rockford Iron Works, Rockford, Ill.

Punch, Shear and Bender, Hand

Armstrong-Bium Mfg. Co., 841 N. Francisco Ave., Chicago

Punches, Hand

Armstrong-Bium Mfg. Co., 841 N. Francisco Ave., Chicago
Hendley & Whittemore Co., Beloit, Wis.
Lewthwaite Mche. Co., T. H., 417 E. 31st St., New York
Whitney Metal Tool Co., Rockford, Ill.

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Wickes Bros., Saginaw, Mich.

Punches and Dies

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Lewthwaite Mche. Co., T. H., 417 E. 31st St., New York
Rockford Iron Works, Rockford, Ill. [N. Y.]

Quenching Bath

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Yoke Supply Co., Wm. S., Canton, Ohio

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Reamers, Adjustable

Cushman Tool Co., Waynesboro, Pa.
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McCroskey Tool Corporation, Meadville, Pa.

Reamers, Cylinder

Hinchley Machine Works, Hinchley, Ill.
McCroskey Tool Corporation, Meadville, Pa.

Reamers, Solid

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Cordelli Manufacturing Co., Detroit, Mich.
Lagerholm Co., E., 9 S. Clinton St., Chicago
McCroskey Tool Corporation, Meadville, Pa.
Ready Tool Co., Bridgeport, Conn.

Reels, Extension

Cincinnati Specialty Mfg. Co., Cincinnati

Riveting Machines

Grant Mfg. & Mche. Co., Bridgeport, Conn.
High Speed Hammer Co., Rochester, N. Y.
Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago

Rod Cutters

Armstrong-Bium Mfg. Co., 841 N. Francisco Ave., Chicago
Hendley & Whittemore Co., Beloit, Wis.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Lewthwaite Mche. Co., T. H., 417 E. 31st St., N. Y.
Tucker, W. C. & F. C., Hartford, Conn.

Roller Bearings

William Co., The, 33 Flatbush Ave., Brooklyn, New York

Scraping Machines, Pneumatic

Anderson Brothers Mfg. Co., Rockford, Ill.

Screw Driving Machines, Automatic

Raynolds Machine Co., Hamilton, Ohio

Screw Machines, Automatic

Brown & Sharpe Mfg. Co., Providence, R. I.
National Acme Company, Cleveland
New Britain Mche. Co., New Britain, Conn.

Screw Machines, Plain or Hand

Potter Tool & Machine Works, S. A., 79 E. 130th St., New York

Screws, Cap and Set

National Acme Company, Cleveland

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Bertolette Mche. Tool Co., Jersey City, N. J.
Brown-McDonald Mch. Co., St. Louis, Mo.
Brownell Machinery Co., Providence, R. I.
Dale Machinery Co., Inc., 541 Washington Blvd., Chicago
Enterprise Machinery Co., 32 S. Clinton St., Chicago

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 Harris Bros. Co., W. 35th & Iron, Chicago
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 Jones Machine Tool Co., Cincinnati
 Kemp Machinery Co., Baltimore, Md.
 Lucas & Son, Inc., J. L., Bridgeport, Conn.
 Lynd-Farguhar Co., Boston, Mass.
 McCutts Lathes & Machinery Corp., J. J.,
 149 Broadway, New York
 McCoy-Brandt Mchy. Co., Pittsburgh, Pa.
 McDonald Machinery Co., St. Louis
 McMullen Mchy. Co., Grand Rapids, Mich.
 Machine Tool Engineering Co., Inc.,
 149 Broadway, New York
 Marshall & Husehart Machinery Co., 17 S.
 Jefferson St., Chicago
 Molitor Mchy. Co., Chas., 215 S. Clinton St.,
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 Mott & Merryweather Mchy. Co., Cleveland
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 St., New York
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 Norton-Broadway Mchy. Co., Cincinnati
 O'Brien Machinery Co., Philadelphia
 Osborne & Sexton Mchy. Co., Columbus, O.
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 Bank Bldg., Chicago
 Peninsular Machinery Co., Detroit, Mich.
 Prentiss & Co., Henry, Singer Bldg., N. Y.
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 Stocker-Rumely-Wachs Co., 117 N. Jefferson
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 Syracuse Supply Co., Syracuse, N. Y.
 Toomey, Inc., Frank, Philadelphia
 Tubor, Velick & Co., 631 W. Lake St., Chicago
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 Walsh Machinery Co., M. J., Milwaukee, Wis.
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 Chicago

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 Simmons Machine Co., Albany, N. Y.
 Smith & Mills Co., Cincinnati

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 Quickwork Co., St. Marys, Ohio
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Sine Bars

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Slotting Attachment for Planer and Shaper

Moore Co., H. A., Rochester, N. Y.

Slotting Machines

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 Rhodes Mfg. Co., Hartford, Conn.
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Sprockets

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Herbert, Ltd., Alfred, 54 Day St., New York

Steel, Tool

Herbert, Ltd., Alfred, 54 Day St., New York

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Way Co., A. F., Hartford, Conn.
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Etns Mfg. Co., Toledo, Ohio

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Tap Wrenches

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 Burke Machine Tool Co., Conneaut, Ohio
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 Rickert-Shafer Co., Erie, Pa.
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 Whitney Metal Tool Co., Rockford, Ill.
 Workwell Eng. & Mfg. Co., 616 W. Monroe
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 Murchey Machine & Tool Co., Detroit, Mich.
 Victor Tool Co., Inc., Waynesboro, Pa.

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National Acme Company, Cleveland
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Threading Tools

Armstrong Bros. Tool Co., 308 N. Francisco
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 National Acme Company, Cleveland
 Ready Tool Co., Bridgeport, Conn.

Tool Holders

Armstrong Bros. Tool Co., 308 N. Francisco
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 Western Tool & Mfg. Co., Springfield, Ohio

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Tools, Lathe and Planer

Armstrong Bros. Tool Co., 308 N. Francisco
Av., Chicago
Ready Tool Co., Bridgeport, Conn.

Tools, Machinists'

Armstrong Bros. Tool Co., 308 N. Francisco
Av., Chicago
Brown & Sharpe Mfg. Co., Providence, R. I.

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Tooth Rounding Machines

Cross Gear & Engine Co., Detroit, Mich.

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Canton Foundry & Machine Co., Canton, O.

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Fairbanks Company, The, New York
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Stow Flexible Shaft Co., Philadelphia
Underwood Corp., H. B., Philadelphia

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Av., Chicago
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Av., Chicago
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Germanow-Simon Machine Wks., Rochester
Thomas Elevator Co., 31 So. Hoyne Ave.,
Chicago

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Hollands Tool Co., Erie, Pa.
New Britain Machine Co., New Britain, Conn.
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Vises, Milling Machine

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Hendley & Whittemore Co., Beloit, Wis.
New Britain Machine Co., New Britain, Conn.
Silver Mfg. Co., Salem, Ohio
Towsley Mfg. Co., John T., Cincinnati
Whitney & Son, Baxter D., Winchendon, Mass.

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AIR GUN VALVE**

"JUST PRESS"
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**BUY
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KEEP
CLEAN**

**CLEANS
WORK BENCHES
AND
MACHINE TOOLS
MADE IN SIZES
1/8" TO 1"**

**ORDER A SAMPLE
THE W. M. POWELL CO.
1200 DRAPER ST.
CINCINNATI, O.**

Automatic Magazine Fed Screw Driving Machines

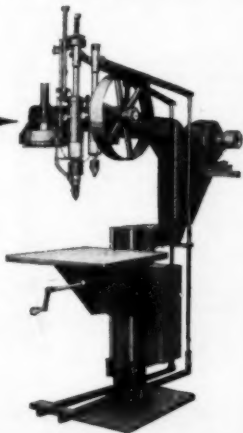
At a Material Reduction in Price

In line with the spirit of the times, we have made such substantial price reductions on Reynolds Power-Driven, Magazine-Fed Screw Driving Machines, that you simply cannot afford to drive screws any longer by costly man power—the most expensive power there is.

**Dump a gross or
more of machine
screws here** →

Then press a foot lever,
and the machine auto-
matically magazines screws
and drives them to de-
sired depth with me-
chanical precision.

**Several Styles and Sizes
for all requirements
What are YOUR needs?**



THE REYNOLDS AUTOMATIC enables one unskilled operator to drive 8,000 to 10,000 ordinary machine screws a day, as well as hex.-head, square-head and fillister-head cap screws. You can figure your own saving.

Tell us the dimensions over all of your work, and the gauge and length of the screws you are driving, and we will recommend, describe and quote on the right machine for your requirements.

The Reynolds Machine Company
Dept. H. H., Massillon, Ohio

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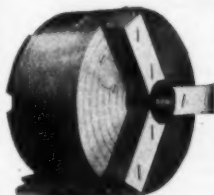
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(Patented May 25, 1920)

Three Jaw Mfg. Type

**L
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Nothing could be simpler than the construction and operation of the Lavoie Air Chuck. Is attached directly to main spindle, and is without gears of any kind. Lavoie

Air Operated

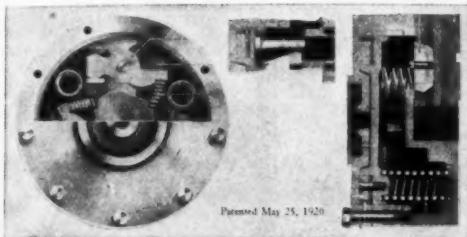
Chucks can be attached and removed as quickly as an ordinary chuck. Only a thin film of air is required to operate the single acting piston, and the operating mechanism of the jaws is such that the heaviest cuts may be taken with moderate air pressure. Write

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THE FRONTIER CHUCK & TOOL CO., Inc.

30 Letchworth St.,

BUFFALO, N. Y.



Patented May 25, 1920

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No! Terrell's Steel Lockers

Are NOT too good for YOU



Because—

- (1) The best service is always an economy.
- (2) Neatness begets neatness, which means a better shop output.
- (3) They add to the pride of the workmen—pride in themselves, in their plant and in their work.
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No, they are *not* too good for you, whether you need a half dozen or a gross. One source of economy is that you may put in only what you need, whether a few or many, and rearrange and add to them later, without destroying or tearing down anything, and always have a symmetrical locker system of the first class—it can grow with your growth. And they may not cost as much as you think.

*Put your needs up to us, without obligation
Your purchase will be only at your pleasure*

Terrell's Equipment Company

Hall & Division Sts., Grand Rapids, Mich.

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Weigel Single-Wheel "Kwality Kaster"

Will not crush or break. Swivels on steel machined rollers. The best single caster on the market.

Double-Wheel "Trukaster"

Lasts three times as long as others. Easiest running, strongest, and most durable double-wheel caster made. Has heavy plates and axes.

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**THE HAMILTON
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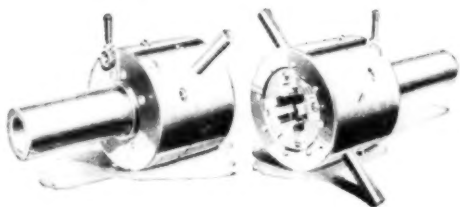






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Self-Opening Die Heads



"On-The-Job-Modern" would be a good name for our die head, because it is so dependable, so simple, and so strong. It's a stranger, almost, to the tool room and adjustment idleness. It's a real producer.

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The "New Britain" All-Steel Bench Drawer

A Drawer that's Unbreakable
That is Light for its Strength
That Moves Freely and Never Binds
That Keeps Out Pilferers, Water and Oil



Furnished as a unit, it requires no fitting or cutting of bench. Shipping weight, only 40 pounds.

A hem of triple thickness around the upper edge and the welding of all joints provide great strength and durability. The slide ways are integral with the top and insure a smooth, free movement, without tendency to bind.

A solid sheet metal top makes impossible any pilfering from the rear. It also prevents blocking or a lock-out through wedging of contents, and keeps out any water or oil that might soak through from above.

Folder No. 1202-A describes it fully. We also make a Frictionless Type Bench Drawer, with wooden back, bottom and front, which some prefer, shown in Folder 1202. Write for either or both.

The New Britain Machine Company

**"Shop Furniture
Originators"**



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